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Remarks on the Etymology of Names of Animals.

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(Continued from p. 5697).

IT is not easy satisfactorily to trace the origin of the word *fox*. Richardson ascribes it to the Gothic verb *foxa*, to deceive; but it is far more probable, from the analogy of similar instances, that the verb has its origin in the name of the animal. Talbot refers *fox* to the old English word *fax*, hair (whence the name of Fairfax), as if the creature were named from its long bushy tail. It is, at all events, identical with the German *fuchs*, and this latter word strongly reminds us of the Latin adjective *fuscus*, which properly denotes a reddish brown colour; but I would not venture to affirm that this resemblance is anything more than accidental. *Vixen* is only a feminine form of *fox*, and was originally written *fixen*, or, more anciently, *foxin*. It appears from an early period to have been applied to quarrelsome snarling people, irrespective of sex; and, however the ladies may rebut the charge, one cannot help remarking the significant fact that language and custom have now made this word the monopoly of the fairer sex. In Scotland the fox is known as the *tod*. This word in Gaelic means a clod, or bush, or a quantity of wool, and we ourselves use it to denote a measure in Wool weight. As applied to the fox, it seems to refer to his bushy tail, and this analogy supports the conjecture of Talbot which has been already alluded to.

Cat in Latin is *catus*; French, *chat*; Greek, *γάτος*; Turkish, *keti*; Arabic, *kitta*; but I am quite unable to deduce the meaning of the name. *Kitten*, of course, is only a diminutive form. The familiar

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title of *puss* seems to be the same as the Latin *pusa*, or *pusilla*, tiny, a name of endearment originally applied to a little child, and thus transferred generally to any pet, especially to the cat, and, from the similarity of its long soft fur, to the hare. Talbot's conjecture as to the origin of *puss* is no less amusing than it is curious and far-fetched. Finding that it is applied to both the cat and the hare, he argues that the Latin *lepus* (hare) may have been corrupted in French into "le puss," and that we have borrowed our word from this. But in Welsh the hare is called *câth eithen*, *i. e.* furze or gorse *cat*. Little children call their warm neck-comforters by the name of "pussies," and the soft "catkins" of the willow and sallow take their name from the same source, so that I have little doubt that the origin I have suggested for *puss* is the correct one. *Grimalkin*, a name which is sometimes given to the cat, is compounded of *grey* (French, *gris*) and *Malkin*, a diminutive form of "Moll," and is one of the many cases in which a Christian name has been applied to some familiar animal.

Walrus is the Norwegian *hvalros*, *i. e.* whale-horse. Another Norwegian name for the animal is *rosmar*, which is similarly compounded of *ros*, horse, and *mor*, the sea.

The *whale*, in the Scandinavian dialects, is called *hval* or *hvalo*. In Greek it is φάλη and φαλαῖνα; in Latin, *balæna*. All these are identical with our word, and are modifications of the same root as appears in our verb to *wallow*, and which we ultimately trace to the Hebrew *pâlal*, to roll. Old Isaac Walton tells us that Pliny "speaks of the fish called the Balæna, or whirlpool;" and assuredly the unwieldy wallowing of these monsters of the deep would naturally suggest their distinctive appellation.

Dolphin is the Greek δελφὶς, a name which was in all probability originally applied to our *porpoise;* and, when we consider the origin and affinities of this latter word, we can hardly think the resemblance between δελφὶς and δέλφαξ (a pig) to be a purely accidental one.

Porpoise is corrupted from the French *porcpoisson*, hog-fish. Similarly it is called *marsouin*, and in German *meerschwein*, *i. e.* sea-swine, and in the Breton dialect *morhuc*, or sea-hog; showing that the resemblance of its general contour to the back of a pig is generally appreciated.

In Mr. Bell's 'British Quadrupeds' we read "Grampus, says the Rev. Mr. Barclay, is the Saxon *hranfisk*, which signifies grunting fish. I cannot, however, help thinking that the more obvious and probable etymology is the French *grand poisson*, great fish." There is an objection to this latter suggestion, namely, that it does appear, from Mr. Barclay's remark, that *hranfisk* is a name which actually is applied to the grampus, whereas I am not aware that the French ever use "grand poisson" to designate that animal; and, in endeavouring to etymologise, we cannot confine ourselves too close to facts as they are, or too carefully avoid theorizing on what simply might be.

I again copy from the 'British Quadrupeds' the remarks upon the name of the *caaing whale.* "These whales follow their leader with blind confidence, and hence their pursuers endeavour to guide the leader on shore, as they are then morally sure of the whole herd. Caaing is a Zetland name, generally considered by authors as indicating *calling, i.e. leading* whale. But Mr. Barclay assures me that the real meaning of the word is 'driving.'"

Beluga is a Russian word, and is said by Webster to signify *white fish.*

Rorqual is compounded of *hval* or *waale*, and *rohr*, signifying whale *with folds*, in allusion to the series of longitudinal folds beneath the throat of the animal.

Horse is the Icelandic *hross, ross;* Sueth., *hors, horsa, ors;* French, *roussin.* These words are of kindred origin with the German *reiten*, and our *ride, road*, &c. We may also compare the Latin word *rheda*, a chariot; and thus Etymology alone would teach us how very ancient is the use of the horse as subservient to man. The name *mare*, too, reveals to us some very curious and interesting facts. Although it is now restricted to the female horse, yet it is no doubt identical with the Celtic *march*, which simply implied a war-horse, without restriction as to sex. We trace this same root in many other words: thus, *marshal* (French, *maréchal*) meant originally the commander of an army; *march* was strictly the route of an army; the "marches" were the boundaries of two countries, which used to be the perpetual scenes of border warfare, and, hence, *marquis* (Lat. *marchio*) was a name given to those barons who lived near the boundaries, and whose especial duty it was to keep off marauders. All these words are to be referred to one parent stock, which we see in the Latin *Mars*, the god of war, *mors*, death, and in the first syllable of our own *murder.* Surely we can need no stronger testimony than is afforded by these etymological facts to the *martial* spirit of our Teutonic forefathers, and to the well-known efficacy of their cavalry and terrible scythe-armed war-chariots.

A *steed* is properly a *stud* horse. *Colt* appears to be etymologically identical with the word *child*, both of them being merely general terms for offspring. *Foal* and *filly* are the same as the Latin *pullus*, young, and the Greek πῶλος, a foal. It is curious that we have exactly preserved the Greek form in the word tad*pole*, *i.e.* a young toad. *Pony* is doubtless, as Johnson derives it, a small or *puny* horse. The *barb* reminds us, by its name, of Barbary, the country from whence it was first introduced.

The etymology of *cob* is worth the trouble of unravelling. A cob is a strong thickset sort of horse, and the adjective "cobby" is still used, in the dialect of some parts of Yorkshire, as an equivalent for stout. In *cob*loaf, *cob*nut, and a host of similar compounds, the idea is evidently that of size. Our word *gaby* (the Italian *gabbiano*) is again of the same root, and the signification of these words, which mean what we should call a "thick-skull" or "blockhead," all lead us up to the original source, which lies in the German *kopf;* Latin, *caput;* Sanscrit, *kepala;* all signifying *head.* In like manner the name of the *chub* is derived from its large head, and the root ramifies into a thousand directions, and reappears in a hundred words where you would least suspect it, but in every case it is intimately connected with one or other of its three leading ideas, which seem to be size, strength, and stupidity.

A *dray* horse no doubt takes its name from the verb to *draw*, as being specially adapted for the draught of heavy burdens. In *hackney*, and its contracted form *hack*, we are again led back a long way: through the French *haquenée* we can trace it to the Italian *acchinea*, which is a diminutive form from the Latin *equus* (horse); and the identity of this with the Greek forms ἴκκος and ἵππος, Sanscrit *açvas* (horse) and *ibhas* (elephant), both of which come from a root signifying to carry, may be satisfactorily established by a number of intermediate modifications. From the same source we have *hobby*; Dutch, *hoppe;* which is almost the same word as the Greek ἵππη, a mare. *Hobby*, as the name of the hawks so called, is one of those curious instances in which two words appear to be similar, while they have, in reality, nothing whatever in common. *Nag* is the German *nake*, from the Anglo-Saxon *hnægan*, our modern *neigh*, a word which is an imitation of the sound which it characterizes. *Palfrey* is a word borrowed from our Norman ancestors, and carries us back to the old days of falconry and chivalry: in French it is *palefroy;* in Italian, *palafreno;* and is clearly derived from *par le frein*, signifying a ladies' horse, *i.e.* one led *by the rein*, at the hands of the attendant page or knight. In the word *roan* it is possible that we may have another instance of what I have before alluded to under the name of a "pregnant" etymology; for although the reference to the colour of the "red-roan steed" is abundantly sufficient to account for the name, yet it is very possible, as Mr. Talbot suggests, that it may have originally had reference to the celebrated breed of *Rouen* horses. In like manner *Sheltie* will preserve a geographical fact which may become curious in some future generation, should this breed ever become extinct in its original birth-place, the Shetland Isles.

Ass is the Latin *asinus;* French, *âne*, which is corrupted from *asne.* The root seems to be identical with that of *ear*, which is the Gothic *auso;* Greek, οὖς, and, in the Laconian dialect, αὖς; Hebrew, *ôzen.* There is a common word connected with this root, which would be the very last in which we should be likely to suspect any reference to an animal: a painter's *easel* is the German *esel* (ass), which is identical with the Latin *asellus*, a diminutive form of *asinus.* We ourselves speak of a clothes'-horse, &c., and so the Germans also use *bock* (buck), and the Greeks ὄνος (ass), while the Greek word for easel is κιλλίβας, which is compounded of κίλλος, an old word for *ass.* In Greek we find the verb ὀγκάομαι, to bray. Comparing this with our *donkey*, it seems probable that both words originate from the same idea, *viz.* imitation of the animal's voice.

Mule is the Latin *mulus;* French, *mulet;* and may be connected with *molior*, I labour; in Greek with μῶλος, labour, and μολεῖν, to go; in our own language with the old word *moil*, and, indeed, the primitive orthography of the word was *moyle* or *moil.* In the Cornish dialect this latter word signifies *barren*, and, to say the least of it, this is a very remarkable coincidence, and it is quite possible that our word may partake of the double parentage; although it is equally possible that the stubborn *mulishness* of the animal, coupled with its sterility, may have suggested the name for a hard and barren soil.

Pig is the Danish *bigghe, vigghe.* These two forms strongly remind us of the nursery name, "piggy-wiggy," and suggest the idea that the name of pig is derived from its squeaking cries, just as hog and sow are taken from its more sonorous grunting. This idea is confirmed by the words which Shakespeare puts into Aaron's mouth, when he murders the nurse:

> "Weke! weke!—So cries a pig prepared for the spit."
> *Titus Andronicus*, Act iv. Scene 2.

The pig is still the especial food of our labouring poor, and, as many writers have remarked, a study of words shows this to have been the case for centuries past. The animals which supply our food, so long as they are alive, are known by their old Saxon names, as *ox*, *calf*, *sheep*, &c.; but, as soon as they are dead, their flesh receives a Norman name, such as *beef* (*bœuf*), *veal* (*veau*), *mutton* (*mouton*). So, too, with our present animal, the fresh *pork* and the dainty *brawn* were for the tables of the Norman lords of the soil; but the Saxon churl was allowed to feast on his own *bacon*. This word is variously derived. Johnson takes it as though it were *baken*, *i.e.* dried meat. Webster refers it to the German *bache*, a wild sow. But in a curious old book, printed in 1605, and intituled 'A Restitution of decayed Intelligence in Antiquities,' we find the following explanation of this term: "But whereas swyne's flesh is now called by the name of bacon, it grew only at the first unto such as were fatted with Bucon, or Beech-mast."

We can trace the word *hog*, in some modification or other, through all the cognate languages, and it is, as has been already remarked, imitative of a pig's grunt,—a sound which may be fairly represented as "ugh." In Welsh *hog* is *hwc;* in Persian and Zend it is *chuk*, a form which reappears in the old English *chuck*, and is still retained in the name of the American wood*chuck*. In French this form gives us *cochon*. The Greek word ὗς is an intermediate form, and supplies us with the link which binds together the apparently dissimilar words *hog* and *sow;* for our words *sow* and its plural *swine* are manifestly the same as the German *sau;* Latin, *sus;* Greek, σῦς. This last is usually derived by lexicographers from σεύω, to rush, in allusion to the fierceness of the wild boar; but, when we remember how commonly the aspirate in Greek is merged into a sibilant, we can hardly help considering ὗς and σῦς to be only different forms of the same word. This view, too, is confirmed by the call to pigs which we can hear in any farm-yard, "Sus! Sus! Sus!" And this is a good example of an Etymology which is undoubtedly sound, although, at the first glimpse of it, it seems to be the very contrary.

Boar is the Anglo-Saxon *bar;* Dutch, *beer*. It forms the last syllable of the German *eber* and Latin *aper*, and appears again in the Latin *verres* and Sanscrit *varaha*. All these words spring from a kindred root, which is always connected with the idea of roughness. We find it in the Latin *barba* and in our own *beard* and *br*istle, and the word *boar* no doubt refers to the bristly back of the animal.

Deer affords us an instance of a word which was originally used in a very wide sense, but has been gradually restricted to one particular animal. The Anglo-Saxon *deor*, German *thier*, are the same as the Greek θὴρ, a name of wild animals in general; but the stag, as the noblest of the beasts of chase, has monopolized the title of *the* beast, *par excellence.* The Greek θὴρ leads us, through its dialectic variation φὴρ, to the Latin *fera*, by which, and the French *fier*, we arrive at our *fierce*. *Buck* is from *bocker*, to strike, and when we compare with it the French *bouc*, a he-goat, we shall readily arrive at the conclusion that it was a general title, applied to the males of horned animals, and more lately extended to others, such as the rabbit, &c. Still the stag preserves the same pre-eminence which we have seen to be indicated by the name of deer, for "a buck" is, again *par excellence*, understood to refer to the stag alone; while, if we apply the name to other animals, we always specify the kind. A further instance of this is found in the name we give its flesh, *venison*. This name was originally given to the flesh of all beasts killed in hunting, as we see by its derivation from the French *vener*, to hunt; but it was soon restricted to the flesh of the royal beast of chase alone.

Doe is the Anglo-Saxon *da;* Dutch, *deyn;* French, *daim;* Latin, *dama.* Richardson derives it from the Greek δεῖμα, timidity; but this is one of those mere guesses which always excite suspicion. May it not be a kindred form with δάμαλις, a heifer, and δάμαλος, a calf? These words come from δαμάω, which is identical in meaning and etymology with our *tame*. *Doe*, like buck, may have originally been a sort of generic term, referring to the gentleness and tameness of the female animals as compared with the males.

Hart is the Anglo-Saxon *heord;* German, *hart*. It is the same word as *hard*, and is meant to imply strength, an idea which we trace very strongly developed in the kindred words in Greek. *Hind* is akin to the Latin *hinnus*, a mare; Greek, ἶννος, a filly. The Latin *hinnio*, to neigh, and our own word *whinny*, show us that these names are imitative of the voice of the animal; and it seems probable that the low quiet cry of the doe has caused the name to be transferred to her. In all probability *fawn* is another word from whence we may infer the high estimation in which the stag was held in the old days of the chase. It is the French *faon*, *fan*, which is contracted from the Latin *infans*, a word which signifies "speechless," and is, properly, only applicable to human infants.

Skinner suggests that the origin of the name *stag* is to be found in the Saxon *stigan*, our *stick*, in allusion to its sharp antlers, an etymology which requires confirmation from the analogous term *buck*. Junius, with his usual mere punning guess, takes stag from στείχειν, to go in order. Tooke believes it to be akin to the word *stage*, and to allude to the lofty bearing and erect head of the animal

Fallow is an adjective, describing the general colour of the deer to which it is applied, the Anglo-Saxon *fealewe* being akin to the Latin *helvus*, *gilvus*, and to our own *yellow*. It is most curious to trace this word through the almost endless ramifications of its root, which, as I believe, may be ultimately carried back to the Anglo-Saxon *gyl*, and to *heol*, a name of the sun in some old Teutonic dialects. These affinities are most admirably worked out by Mr. Talbot in his 'English Etymologies,' but, as is too often the case, his observations are most painfully in need of some connecting thread.

Roebuck presents us with an ample scope for speculation as to whether the first syllable of its name be the Celtic *roe*, red (as the *roe* of fish is named from its colour), or whether it be not the Anglo-Saxon *rœge*, *raage* (for *hrœge*), signifying a goat, and akin to the Greek τράγος Possibly it may partake of both relationships: certainly its scientific name, *Cervus capreolus*, inclines us to be in favour of the latter etymology. In French *chevre* is a goat, but *chevrette* is a doe; *chevreuil* is a roebuck, but *chevrotine* is deer-shot. This confusion has partly arisen from a certain resemblance between *cerf* (Latin, *cervus*), a stag, and *chevre* (Latin, *caper*); and the gradual progress of form from animals of the goat tribe to those of the deer has in all probability tended still further to complicate this etymology.

Were I to endeavour to trace the various and most dissimilar modifications of the root which appears in our word *goat*, I should infallibly, though, as I believe, unreasonably, be accused of romance by the general reader. It is the Anglo-Saxon, *gœt*, *gat*; but in German the *t* becomes *s*, and the word appears as *geis*, and also in the still harder form *gems*. It is the Gothic *gaitei*, *gaitsa*, and this latter form reminds us of the Sanscrit *adsha*, which, be it remembered, was pronounced with a strong guttural *g* before the first vowel. Through various other forms we trace it to the Hebrew *gâz*, which is referred by Gesenius to the root *gâzaz*, to be strong. We must, therefore, reject Junius's guess, that it is derived from χαίτη, hair, as well as Wachter's more reasonable conjecture that it comes from the Saxon *gytsean*, to be lustful. *Kid*—the Turkish *getsi* and Hebrew *gedi*—belongs also to the same family as *goat*.

It may not be out of place to notice here some of our own words which are derived from the names of the goat. To *caper* is precisely the same word as the Latin for a goat; and hence, too, comes *caprice*, *i. e.* a whim as sudden and unlooked for as are the bounds and vagaries of a kid. Who, again, would have thought that there could be any connexion between the name of the London "cab" and that of our animal? But it is quite certain that *cab* is an abbreviation of the

French *cabriolet*, a word derived from *cabri* (caper), a kid, and employed to designate a light easy-going kind of vehicle, which was able to traverse roads along which the original heavy and lumbering chariots were unable to venture.

Sheep is the German *schaf*. This word is referred by Richardson to *schaffen*, in the sense of to drive, the allusion being to the driving of sheep before the shepherd, just as one of the Greek words for sheep — πρόβατον — may be derived from πϱοβαίνειν, to go before. It may be that the *schäfer*, or shepherd, was so called from the *schaft*, *i.e.* stick (our "shaft") with which he drove his flock, and that thus his name may have grown to be applied to the objects of his care; or, possibly, the etymology may embrace both these ideas.

Richardson derives *ram* from the Anglo-Saxon *hremman*, to *butt*, or to *ram*, as we say; but, as we have already remarked, it is not probable that any such verb will be derived from the habit of the animal, but rather *vice versâ*. Family resemblance leads us in quite another direction. *Ram* is very nearly the same word as its Greek equivalent ῥὴν, which is probably only another form of ἄῤῥην, male; and this may be traced to an old root signifying strength. So, too, *tup* is taken from a root which is now little used by us, but which is found in the Greek τύπτειν, to strike. *Wether*, or *wedder*, is similarly referred by Richardson to the Anglo-Saxon *witheran*, to resist.

In the word *ewe* I think we may trace a very interesting story. It is the same word as the Latin *ovis* and the Greek ὄϊς, which are, *possibly*, imitative of the low inward bleat of the sheep, which is a very distinct sound from its well-known "baa." There are many old words wherefrom we may gather the fact that the wealth of our primitive forefathers lay in their cattle. Such words are the Hebrew *mik' neh*, which signifies both cattle and wealth or riches; the Greek κτῆνος, cattle, as compared with κτῆμα, a possession; and the Latin *pecus*, cattle, as compared with *pecunia*, money. I believe that our present word indicates a similar state of things; for although *ovis* is a sheep, yet *opilio* is a shepherd; and this latter word seems, at all events, to be connected with *ops*, *opes*, riches.

Lamb is the Danish *lam;* German, *lamm*. In Welsh *llanu* is to bound, and is nearly akin to *leap*, and other words of the same family. I suspect, therefore, that the lamb is so called from its frolicsome gambols.

We may here refer to a fact which is but little known. The breed of sheep from whence we obtain the *merino* wool was originally derived from our own country. Stow and Baker tell us that in the year

1404, Edward IV. "gave a license to pass over certain Cotteswolde sheepe into Spain." These were the origin of the present merinoes, a name which is a slight corruption of the Spanish *marino*, and refers to the original importation of the breed from "beyond the sea."

Ox is the Anglo-Saxon *oxa;* Danish, *oxe;* Gothic, *auhs.* The root will be found in the Icelandic *aka;* Sueth., *acka*, to draw, which is the same verb as is found in the Latin as *ago*, and in Greek as *ἄγω.* The connexion existing between these words points out to us the primitive use of oxen for the yoke; while the horse, as we have seen that its names imply, was used for riding, or for war, but not for agricultural purposes.

Bull is identical with its Latin equivalent *bos;* Greek, *βοῦς*; French, *bœuf;* words which are all formed from the root *bo*, imitative of the loud bellowing of the animal. So, too, *cow*—which in the Teutonic languages appears as *ko* or *kuh;* Persian, *gau*, *kau;* Malabar, *ko;* Sanscrit, *gou*, *ghau*—is also a name imitative of the voice; and it is curious that in Greek we have both the verbs *βοάω* and *γοάω*, expressive of a loud and deep sound. Richardson suggests that *cow* is derived from the Anglo-Saxon *ceowan*, to chew, from its habit of chewing the cud; but this very plausible conjecture is found to be unsupported by the analogy of other languages. Professor Donaldson has some interesting remarks upon the curious coincidence to be remarked, throughout the Indo-Germanic languages, between the words which express the idea of *land* and the names of the cattle which till it. Thus, in Sanscrit, *gaus* means both *cow* and the earth; and in this latter sense we find the root in the Greek *γῆ*, *γαῖα*, and the German *gau*, country. The same analogy may be traced, though not quite so evidently, in the words related to *bull.* *Kine* is the plural of *cow*, just as *swine* is the plural of *sow.*

In *calf* we have another instance of a word which was originally used as a general term, but which has been gradually restricted to an individual case, although, indeed, we still speak of a hind's *calf*, or of an elephant's *calf.* Our word is the Anglo-Saxon *cealf;* Swedish, *kalf;* Danish, *calv;* German, *kalb;* and it is akin to the Dutch verb *kalben*, to vomit, which comes from a root indicative of gaping, having its nearest English analogues in *yawn* and *yean.* Calf, therefore, properly means any offspring. Webster ingeniously accounts for the use of this word to indicate part of the leg. A calf is, properly, as we have said, any offspring: hence it comes to mean an offshoot or protuberance, and so has been applied to the protuberant part of the leg. In the old expression, "calves of the lips," it is hard to say whether the reference be to the *protruding* of the lips, or, adhering to the strict meaning of the word, to the *open mouth.*

I cannot satisfactorily account for the first syllable of *heifer.* The second syllable is, no doubt, identical with the Anglo-Saxon *fear;* German, *farfe;* Greek, πόρτις; all of which words refer to the same animal. In Hebrew, too, we find *par,* a bull, and *pârah,* a heifer, words which preserve the analogy of ox, and are formed from the same root as has given us our verb to *bear.*

I again quote from Mr. Bell: "When a cow produces two calves, one a male, and the other a female, the latter is styled a *free martin,* which, it is said, never breeds. In Scotland a cow or ox which is fattened is called a *mart.* Hence, probably, our term originated; for the female, being unfit for breeding, was *free,* or at liberty, to be fattened for the *mart,* or market."

The breed of *Kyloe* oxen are said to derive their name from the Scotch islanders having to drive their beasts across the "kyles," or ferries, on their way to market.

Neat cattle in Anglo-Saxon are called *neat, neten;* in Swedish, *nöt;* in Danish, *nöd.* The Anglo-Saxon *geneat,* herdsman, is also akin. The root will be found in the Welsh *cnud,* a group, and kindred words are the Latin *nodus,* our *knot, knead,* and *need,* in all which words the common idea is that of pressure. *Neat,* therefore, is a generic name for *herded* cattle.

The first letter of *steer* is merely euphonious, and forms no part of the root. The word is identical with the Latin *taurus;* French, *taureau;* Arabic, *thawr;* Chaldee, *tora.* In Hebrew the initial *t* becomes *sh,* and the word appears as *shor.* It comes from a root signifying strength, which we trace in the Latin *torus,* muscle. *Beeves,* it need hardly be said, comes from the French *bœuf,* which also supplies us with our word *beef.*

Cattle is said to be a general term, corrupted from the Latin *capitalia, i.e.* the personal property of any individual. We find the same word in the legal term "goods and *chattels.*"

Squirrel has a pretty origin. It comes to us through the Latin *sciuriolus,* a diminutive of *sciurus,* which is the Latinized form of its original Greek name, σκίουρος, a compound of two words signifying "shadow-tail."

The first syllable of *dormouse* no doubt refers to its sleepy propensities, and is of a root which appears in the Latin *dormio,* Greek δαρθάνω, to sleep, and also, as I believe, in our *dr*eam. The second syllable of our word is, now, at all events, simply *mouse.* But as hermaphrodite etymologies—by which we mean words compounded of two roots which are taken from different languages — are very rare, and to be received with suspicion, Talbot has suggested that our word may have been originally the French or Norman "la dormeuse," the second syllable of which would soon be corrupted, by country people, into *mouse*.

The word *mouse*, itself, is a very ancient and wide-spread name. In Anglo-Saxon it is *mus;* in German, *maus;* in Latin, *mus;* in Greek, *μῦς*. It is ordinarily derived from a root which is expressed in the Greek *μυεῖν*, to hide, although Pott considers that it may come from the Sanscrit *mush*, to steal.

Rat is the French *rat*, and appears in modern Latin as *rattus*. Wachter refers its origin to the German *reissen*; Anglo-Saxon, *hreddan;* our own *rid;* to which the Latin *rodo*, to gnaw, is akin. The name, therefore, may combine the ideas of gnawing and plundering. It is difficult to account for the name of *Norway rat*, as this species is aboriginal to Asia, and was not even known to exist in Norway when our name was given to it. There is an ill-natured tradition that it was introduced to our country by the same ship as brought in the Hanover dynasty; but this throws no light on the name: more probably it was imported on board of some Norwegian trader, which may have touched at one of our ports.

Hare is a word that has sadly puzzled etymologists. Conjectures concerning its origin are innumerable, and, as it has no equivalent in the Latin and its kindred languages, its affinities are very hard to trace. It is the Anglo-Saxon *hara*, and it is the same word in Swedish. In Dutch and German the *r* gives way to *s*, as it is Dutch *haas*, German *hase*. One very plausible conjecture is that the word is akin to the Anglo-Saxon *hær*, hair; from the long soft fur of the hare. It has been suggested to me by a friend that it may come from the same root as our *hoar*, *hoary;* Anglo-Saxon, *hara;* in allusion to its prevailing colour. Talbot says, "Hare, the most timorous of animals, is perhaps named from the Anglo-Saxon *earg*, timid; *earh*, swift." *Leveret* is the French *lièvre*, Latin *lepus*, and is closely akin to the French *lapin*, rabbit. Indeed a close search will reveal to us a very curious connexion existing between the names for the *hare* and *rabbit*, in the kindred languages. The root is to be found in the Latin *levis* and our word *leap*, indicative of lightness and agility.

Rabbit is akin to the Dutch *robbe*, which probably comes, as Skinner suggests, from the Latin *rapidus*, our *rapid*. It would not be difficult to establish the etymological identity of this word with the

French *lapin*, and, so, with *lepus*, *leveret*, &c., but the pages of the 'Zoologist' are hardly suited to such an attempt.

Cony is the Latin *cuniculus;* German, *canichen;* Danish, *kanig;* Welsh, *cwningen*. Pliny supposes *cuniculus* to be so named from its burrows, but this can hardly be the case. In Greek we find the forms κόνικλος and κύνικλος, but there is some doubt as to whether this be a genuine Greek word, or only the Greek way of writing the word which they borrowed from the Romans. Should it be a truly Greek word, I have little doubt that Mr. Bell's etymology from κονέω, to hasten, would be correct, supported as it is by the analogy of the names for leveret and rabbit.

The *Guinea pig* is hardly an indigenous animal, but as Mr. Bell gives it a place in his 'History of British Quadrupeds,' we may take the opportunity of pointing out the solution of a difficulty which he seems to have experienced. He says, "The name by which this little animal is commonly known is founded upon an error of which I have in vain endeavoured to trace the origin; for I do not find, in any author by whom it is mentioned, any allusion to its being a native of Guinea. The country from which it truly derives its origin is the southern part of the South American Continent,—Brazil, Guiana, &c." Obviously its name originally alluded to the latter province; but as this was an unfamiliar name to most people, while *Guinea* was a "household word," the substitution of the wrong name for the right one would follow almost as a matter of course.

I have now completed the task which I at first proposed to myself; and I would fain hope that at all events *some* readers of the 'Zoologist' have been interested in the remarks I have made. I must again repeat one of my preliminary observations, that I have no doubt I may have made many mistakes. I therefore most earnestly solicit a personal correspondence with any one who is willing to correct me or to afford me hints. I have now collected the origins of about 2600 names of animal, vegetable or mineral objects, and I have exhausted all the means of information within my own reach, and have still a stock of at least 1200 names of which I can find no explanation, but with regard to which I trust that others will be found both willing and able to assist me.

P. H. Newnham.

Guildford, November 19, 1857.

On Bavarian Sporting.

By the Rev. ALFRED CHARLES SMITH, M.A.

I HAVE just been reading (Zool. 5806—7) Dr. Collingwood's graphic account of the game-market at Vienna, and his description brings vividly to my recollection a similar scene at Munich, in the winter of 1840—1, which I spent in that capital; and on looking back to my journals of that date, by way of refreshing my memory on the subject, I have stumbled on some memoranda of various royal hunts of which I was an eye-witness, and by which these markets were supplied. Thinking that perhaps a short description of them may be of interest to the readers of the 'Zoologist,' I venture to transcribe again from my journals; but, for the benefit of those who have had no experience of Munich in the winter, I will first say a few words of that capital and its climate during the cold months, when these royal battues took place. I will premise, then, that Munich is the highest capital in Europe, though, not having a Murray at hand, I cannot state accurately how many feet it stands above the level of the sea. It is situated in a vast plain, or rather in the centre of a large basin, surrounded indeed by mountains, but all of them at a great distance; and on whichever side of the city you may approach you will see for many a league the great kettle-drum-looking domes or cupolas on the summit of the two towers of the Dom Kirche, standing up as beacons to guide you on to your journey's end. The plain, too, in which the city stands is truly Bavarian, not only so vast and apparently interminable, but perfectly flat, and its surface unbroken by hedges, banks or any other kind of fence, since fences are not wanted in a country where the cattle are never turned out to grass; and in the autumn, when the crops are off the ground, you may strike off from the highway immediately after leaving the town, and ride in any direction, so long as the open weather lasts. But though Munich is one of the sultriest and certainly the very dustiest of towns in the summer, it is one of the very coldest in the winter, without shelter on any side, and exposed to all the winds of heaven: for four months the weather is very severe, and the cold is intense; and there is no *gradual* change, but in a single night you pass from the height of summer to the depth of winter: from November to March the snow lies frozen and trodden into a hard, solid mass: all wheels disappear from the streets, and the silent sledges, unheard save through their jingle of bells (which the police rigidly require them to carry), come stealing round the corners and along the streets at a very rapid pace. Occasionally sentinels are found frozen at their posts, though the guard is relieved at very short intervals, and all are well provided with warm clothing against the intense cold. The rapid river Tsar is arrested in its course, and soon becomes a dense mass of ice; and for four months winter reigns triumphant, without an interval of a thaw or the remotest prospect of a thaw for a single hour.

Such is the climate and such the situation of the Bavarian capital; but, notwithstanding the cold, the air is clear and the sun shines cheerily; and when it was announced that the king would shoot hares at a certain spot about two leagues distant from the town, it required no second summons to persuade four Englishmen to drive to the spot, eager to be spectators of the scene. When we reached the ground the royal sportsmen had not yet arrived, but a large number of keepers stood ready, and pointed out to us the most astounding preparations for sport I ever beheld. For two days previous to the hunt a large number of peasants had been employed to beat up the country for several miles round: this they effected by making a cordon, encircling the game and walking up towards the centre; and thus they gradually drove the hares in immense numbers into a very small space, viz., a little cover of perhaps four acres in extent: the hares so driven up had been enclosed by a wall of canvas from nine to ten feet in height, and when the keepers took us inside the enclosure, prior to the arrival of the king, there were the wretched victims lying huddled together like a dense flock of sheep, to the number of sixteen hundred, as we afterwards ascertained on counting the slain. Presently the royal sledges arrived with the king (now the ex-king) Ludwig, the Crown Prince (the present King of Bavaria), Prince Luitpold, Prince Max, and two other royal princes, for none but royal princes may shoot in these right royal battues: immediately they entered the canvas wall, and took up their positions at the farther end of the enclosure, each within a certain little nook of boughs, waist high, which had been previously prepared, of fir branches; whether as a protection against the rage of wounded hares, or as a pretence at ambush, I know not: and now the sportsmen are all standing behind their respective defences, in a line, about twenty yards apart from one another, and with their faces towards the canvas wall, which might be thirty yards in their front, each armed with a double-barrelled gun, and each with a whole posse of keepers behind him, with other guns to load and hand over. The word is given that all is ready; and now the keepers and others, with whom we marched, forming a close line, began to walk up from the other end of the enclosure, driving all the unfortunate hares in a body towards the guns; as they neared the shooters they naturally ran to the sides; and now they were hunted round the open space, and made to run the gauntlet in front of all the guns: then the murder began in earnest, and for the first ten minutes each royal forefinger was continually engaged in pulling trigger after trigger, for as fast as each sportsman shot off his gun another was handed in its place. The hares at first came round in perfect droves, and then it was not only impossible to miss, but also impossible to kill without wounding many others; so then a horrible sight ensued, of hares unnumbered shuffling about with broken legs, wounded in every possible way, half-dead, bleeding, and uttering their mournful cry, so like the cry of a child. Soon the ground in front of the shooters was white with dead hares; still the slaughter went on, at first amidst a roar of guns, then a dropping fire, then single guns at longer intervals, then occasional shots, then it ceased, but not till every one of the hares enclosed had been driven round and round till it had met its death: happy were those first slain, for, once enclosed within the canvas, escape was impossible: if the poor animal had run the gauntlet before all the shooters once or twice, and had escaped unharmed or with a broken leg, the third or fourth round must destroy it: nothing living could escape. An unlucky squirrel, appalled at the noise, descended a tree close to the king, who, with a shout of delight, ruthlessly shot it as it gazed at him in amazement from the ground at about ten yards' distance, proving that if "a cat may look at a king" the old adage does not hold good with a squirrel, for this poor unsuspecting innocent paid for its temerity with its life. About twenty roe, bucks and does, had been accidentally enclosed with the hares, and these, too, must of course suffer the same fate, and were shot in like manner, save and except five or six bucks, which, terrified at the first noise of the shooting, and not yet having been shot at, ran back towards the advancing line of keepers, who immediately raised their hands and sticks to turn them; but, led by one noble fellow, the bucks took a spring right over our heads, hats and uplifted sticks, not a little to the delight of the Crown Prince, who, priding himself on his English habits and ideas, and knowledge of the English tongue, told us, he "would give any sum for a hunter who shall jump so," though, as the Germans never hunt or leap, and indeed there are no fences in Bavaria, we did'nt see of what possible use to his Royal Highness such a fencer would have been. Some of the roebucks, when driven to desperation, charged the canvas wall, and most of them fell back, unable to clear so great a height; but three splendid fellows, more nimble and more fortunate than their companions, cleared it in great style and escaped. At length the shooting grew slacker and slacker, and after two hours' firing the massacre was ended: then before each sportsman's bower of firs were placed, in rows, the hares that were slain by him, and were lying dead in front of his stand; then they were counted, and great rivalry existed among the shooters as to who had gained the greatest score. The whole number killed was above 1600, and the king, who was always especially friendly and communicative to the English, observed to us, "There is so much more glory in killing them thus than if we only killed a dozen or so as you do in England." It would have argued a sad ignorance of Court etiquette to demur at any proposition His Majesty might think fit to assert, so we contented ourselves with a smile and a bow, but we secretly entertained rather a different opinion. The hares were now suspended on poles, and these were laid across some light waggons, and thus three waggons loaded with hares trotted triumphantly into Munich to the king's cellar, where on the following day hares killed by royalty were sold to the public at thirty-six kreutzers apiece, or about one shilling English. At a subsequent battue the same party killed 1200, and on another occasion 900 hares; but, as all the hare-hunting consisted of this abominable massacre, we did not care to go a second time.

It may be supposed we were a little disgusted with what we had seen of Bavarian sport; but when we were invited to witness a stag hunt we said to one another, "Now at least we shall see something more worthy of the name:" judge, then, of our disappointment when, on arriving at the wood fixed on for the rendezvous, we found the preparations in all respects like those made for the hare hunt; the canvas walls, the posse of keepers ready to drive the game round, the nooks of fir branches for the shooters, all as before; indeed, excepting that the wood was larger, the canvas walls something higher, and that rifles were substituted for guns and roe for hares, it was the same unsportsman-like massacre we had seen before. There was a good deal of bad shooting displayed on this occasion, and some of the stags, after being driven about and shot at a good deal ineffectually, became at last so terrified that they laid down and refused to get up. At the conclusion it was found that about fifty bucks were shot, and these, too, were taken to the king's cellar and disposed of next day, just as the hares; and loyal subjects could there buy royal venison at nine kreutzers (threepence) per pound.

After this fresh instance of barbarous murder we were not very sanguine when we started to see "a wild boar hunt," for in such terms it was announced to us; and yet we had a lurking hope that there might be some sport in this, but again we were doomed to disappointment; and when we arrived at the place appointed (the middle of a large forest) what was our dismay to find that this hunt, too, was to be conducted precisely as the hare and stag hunts had been: there were the canvas walls, within which were the poor boars, driven up by the peasants as before; and not only boars, but pigs of all sizes and ages; all were driven in, and all shot alike, the total number amounting to about forty; none of them appeared savage, indeed they were only half wild, as every day they came for food, placed for them at the skirt of the forest; but some of the boars had tusks of considerable size, with which they might have done considerable mischief if they had courage enough for an attack; but they seemed too frightened to make any resistance, and ran squeaking from place to place in the extremity of their terror, till a bullet put an end to their misery. The head gamekeepers, or "Jägers," were splendid fellows in their suits of green and gold, with epaulettes and swords and sashes, and plumes of dark green feathers in their cocked hats, rather a contrast to the shooting-jackets and leggings of the business-like men we are accustomed to meet at the cover side; however, it was all quite consistent with the sport, and the "Jäger's" fine clothes were not soiled with hard work, but they looked very smart in the forest; and very valiant, too, they were withal, for, when one poor unfortunate piggy came running down a green drive towards us, squealing with terror, one of these brave armed men, dropping down on one knee in a theatrical attitude, exclaimed, to our intense amusement, "Gentlemen, don't be alarmed; I will defend you," with which words he drew his sword, and presented it at the pig; but he, poor fellow, as soon as he saw us in the way was only too glad to hurry off out of sight into the thicket. After this hunt wild boar was as plentiful and cheap at the king's cellar at Munich as hares and venison were at other times.

If any comparison can be instituted among the above atrocious massacres, I am inclined to think that the latter was the most barbarous of the three hunts; and I don't doubt that those sportsmen will agree with me who have been accustomed to hog hunting in India, which I conclude to be the finest sport (in the true sense of the word) that exists, and which undoubtedly requires the greatest exertions and skill on the part both of the horse and rider. I had almost appended some account of the rifle shooting at a mark by the Tyrolese who flock to Munich at certain seasons, and which was really interesting to witness; and also of the horse racing in the same capital, one of the most horrible sights I ever beheld; but, recollecting that such subjects scarcely come within the province of the 'Zoologist,' and fearing the wrath of its excellent editor, I spare the readers of that periodical, at any rate for the present, and conclude.

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
November 9, 1857.

The Mollusca of the Firth of Clyde.

By the Rev. ALFRED MERLE NORMAN, B.A.

(Continued from page 5713).

Fam. X. *Donacidæ.*

*Donax Anatinus (*Donax trunculus*). Included in the lists of Mr. Smith and Dr. Landsborough, but I have not met with it myself.

Fam. XI. *Mactridæ.*

Mactra solida. Bute, Cumbrae and Arran, but it is not a common shell in the district.

* „ truncata. Bute, *Smith*; Lamlash Bay, *Landsborough*.

* „ elliptica. Occasionally taken with the dredge on hard ground in the coralline zone. The specimens from off Cumbrae exceed in dimensions any that I have taken or received from elsewhere; an individual in my cabinet measures one and a quarter inch long and four-fifths of an inch broad.

* „ subtruncata. Is a very abundant shell in the Clyde, and is known in the district by the name of "Aikens." It is frequently used for bait, and is usually found in the sand at low-water mark, and is either raked up from the sand, or gathered by the hand when thrown to the surface by storms. Millport Bay, Lamlash and Ardrossan are prolific localities for it. It attains a large size here, examples commonly exceeding one and a quarter inch long and an inch broad. "A large and much-produced variety is very common on

the Ardrossan sands, in Ayrshire; a similar but smaller one is also common in Lamlash Bay, Isle of Arran, where it is gathered alive at low water to feed pigs (Alder)," *F. & H.* Dr. Landsborough tells us that the name "Aikens," applied to Mactra subtruncata, is confined to the Lowlands; "in the Highlands it is called 'Mureck-baan;' baan denoting the colour, which is white; and Mureck, it is probable, being the Celtic origin of the Latin Murex, the shell-fish which yielded the Tyrian dye or imperial purple."—*Lands. Excur.* p. 218. I must confess that my powers of imagination are at fault, and that I fail to see any connexion between Murex trunculus and Mureck-baan!

Mactra Stultorum (*Mactra cinerea*). This species, together with its variety cinerea, is said by Dr. Landsborough to occur in Lamlash Bay. I have not myself met with it there, or elsewhere in the district. Ayr, *Smith.*

*Lutraria elliptica. During very low spring tides a sand bank is laid bare at Fintry Bay, Cumbrae, extending along the shore, from which it is separated by a belt of water a foot or so deep; at such times fishermen and others go to the bank for the purpose of procuring "Spout-fish" and the Lutraria, which they take there abundantly and of great size. I have likewise taken young specimens with the dredge between Clachland Point and the Corriegills, Arran.

Fam. XII. *Veneridæ.*

*Tapes decussata (*Venus decussata*). This local, but for the most part, where present, abundant shell, must, I think, be regarded with some doubt as a native of the Clyde. Dr. Landsborough mentions it twice (at pp. 337 and 362) in his 'Excursions,' but he does not give it in his more recent lists; nor has it been met with by Mr. Smith or myself.

* „ pullastra (*Pullastra vulgaris, Venus pullastra*). Common here as everywhere. Very good examples of the variety perforans, with the shell strongly laminated, especially at the posterior end, occur in crevices in the masses of shale on the shore of Lamlash Bay, and in old Pholas burrows.

* „ virginea (*Veniorupis virginea, Pullastra virginea, Venus virginea*). Ayr, Bute, Clyde, *Smith.* I have taken unusually large specimens, measuring two inches and four-tenths long, and one and a half inch broad, off the west of Cumbrae. It is frequent in the coralline zone in all parts that I have dredged.

„ aurea (*Venus aurea, Venus ænea*). Mr. Smith records this shell from Ayr, and Dr. Landsborough from Arran. At Loch

Ryan, to the south of this district, it may be procured in great abundance at low-water mark; specimens from this locality are in the British Museum.

Venus verrucosa. I include this with doubt. Mentioned once by Dr. Landsborough (Excurs. p. 362) in a list of Lamlash Mollusca.

„ casina (*Venus reflexa*, *Venus cassina*). This beautiful Venus is met with occasionally on the scallop-bed off the south-west of Cumbrae; it is, however, by no means abundant, and I only succeeded in procuring some half-dozen specimens. I have likewise taken it in Lamlash Bay, and Mr. Smith records it from Ayr. It is probably distributed throughout the district.

* „ striata (*Venus Prideauxiana*, *rugosa*, *gallina* and *laminosa*). Common, and is found with the concentric costellæ at a greater or less distance apart, and more or less laminated.

* „ fasciata. Frequent throughout the district. The colour of these shells from the Clyde are usually dull, and have none of that brilliancy which characterizes their more southern brethren. They are usually, moreover, when found in the Clyde, invested, especially about the umbones, with a black incrustation.

„ ovata. This species is common among nullipore in the laminarian and coralline zones.

*Artemis exoleta (**Cytherea exoleta*). Two very distinct varieties are to be found in the Clyde district; the first, the ordinary form, occurs in and outside Lamlash Bay and other localities; the second is brownish white, entirely devoid of painting, and has the striæ much more closely arranged than usual, and they, moreover, become somewhat raised and lamelliform at the extremities. This last variety, which measures two inches by two and an eighth, is taken near the Tan Buoy, Cumbrae.

„ lincta (*Cytherea sinuata* and *lincta*). Ayr, Lamlash, Cumbrae, Largs. The locality in which I have found it to be most numerous is between the Cumbraes. I have a distortion in which one valve is larger than the other, the one umbone projecting forwards over the smaller one as in the genus Corbula.

*Lucinopsis undata (*Lucina undata*). I have occasionally met with the Lucinopsis to the south-west of Cumbrae, and Dr. Landsborough has taken it in Lamlash Bay.

Fam. XIII. *Cyprinidæ.*

*Cyprina islandica (*Cyprina vulgaris*). The dredge will not unfrequently bring up the Cyprina from deep water where the ground is hard. The west of Cumbrae between Fintry and Shell Bays; between Clachland Point and the Corriegills, Arran; and north-east of Holy Island, may be mentioned as localities.

Circe minima (*Cyprina minima, Cyprina triangularis*). This often beautifully marked shell is common in the deeper parts of the laminarian zone in the Clyde district. Wherever suitable ground, that is nullipore, is present, the dredge will seldom come up without containing one or two examples.

*Astarte sulcata (*Crassina scotica, Crassina danmoniensis, Astarte scotica* and *danmoniensis*). By no means common, though now and then to be met with. West coast of Cumbrae, and Lamlash Bay; Ayr, Bute, *Smith.*

* „ elliptica (*Crassina garensis, Crassina elliptica*). "It was first discovered near Helensburgh, mouth of the Clyde, by H. Witham, Esq., where it appears to be not uncommon." — *Brown.* "The earlier specimens which found their way into collections were chiefly collected by Mr. Nicol, and distributed under the MS. name of gairensis."—*F. & H.* It was so named from Loch Gair, or Gare, at the mouth of which Helensburgh is situated. Mr. Smith has also taken it off Bute. It is, however, very local.

* „ arctica (*Crassina corrugata* and *Withami*). Mr. Smith includes this in his list of recent shells, under the specific names of corrugata and Withami, as having been found in the Clyde and off Bute. Withami is figured by Mr. Smith in his paper; and he tells us that "one valve was dredged in deep water in Rothesay Bay, apparently the same as that found by Mr. Witham in Yorkshire." Astarte arctica, if met with in the Clyde, is probably fossil.

„ compressa (*Crassina compressa* and *striata*). Lamlash, *Landsborough;* Bute, *Smith.*

„ triangularis. I have met with a few examples of this little Astarte among shell-sand from "Landsborough's Bay," Lamlash.

Isocardia Cor. Dredging one day in deep water between Great and Little Cumbrae, I procured two or three single valves of the heart shell. This is the only instance of its occurrence in the district with which I am acquainted. Although the shells had been some time dead, they were certainly not semi-fossil; indeed, the Isocardia has not, I believe, been met with in the glacial beds of the Clyde.

Fam. XIV. *Cardiadæ.*

Cardium aculeatum. Mentioned by Mr. Smith, undoubtedly in error, as "common" in the Clyde.

*Cardium echinatum (*Cardium ciliatum* and *ciliare*). To be found in many of the sandy bays, as for example at Fintry Bay, Cumbrae; and in certain parts of Lamlash.

* „ edule (*Cardium crenulatum*). Nowhere, as far as my observations go, abundant, though generally diffused.

„ nodosum. Fine and by no means uncommon. Shell Bay, Cumbrae; Largs; Lamlash Bay; and between Clachland Point and the Corriegills, Arran.

„ fasciatum (*Cardium elongatum*). Frequent in the laminarian and coralline zones. Fairleigh; Tan Buoy, Cumbrae; Lamlash.

* „ pygmæum (*Cardium exiguum*). Ayr, Bute, Clyde, *Smith*; Lamlash, *Landsborough*. I have not myself been fortunate enough to meet with it.

„ suecinum. Included by Dr. Landsborough in his last corrected catalogue of the Lamlash Bay Mollusca.

* „ norvagicum (*Cardium lævigatum* and *serratum*). Frequent and widely distributed throughout the district. There are two very distinct forms of this shell: the one which is found in the Clyde is subtriangular, the hinder margin being much produced, so that the length exceeds the breadth; two inches and three-fourths long and two inches and five-eighths broad is the measurement of my finest specimen: the other variety, which I have taken off Falmouth, is subovate, the hinder margin suddenly sloping, and not at all produced, the breadth exceeding the length, as, for example, one inch and three-fourths long and two inches and one-fourth broad. On the Devon coast I have taken an intermediate form, in which length and breadth are about equal; it is this form which is figured in Forbes and Hanley.

Fam. XV. *Lucinidæ.*

*Lucina borealis (*Lucina Radula*). Ayr, *Smith*. It is not uncommon in shallow water just off the pier at Lamlash, and I have likewise taken a specimen or two in Kames and Shell Bays, Cumbrae.

„ spinifera (*Myrtea spinifera*). Occurs several times in the lists of Lamlash Bay Mollusca in Dr. Landsborough's 'Excursions.' I have not myself met with it.

* „ flexuosa (*Lucina sinuosa*). Bute, Ayr, *Smith*. Widely distributed in the district, though nowhere common. Largs, Cumbrae, and Lamlash Bay have given me specimens. The spot in which I have dredged it most frequently is close to the Clerk Rock in

Millport Bay; at least thirty single valves may be taken to every perfect specimen.

Fam. XVI. *Kelliadæ.*

Montacuta ferruginosa. I have met with a few fine examples thrown up on the sand at Millport Bay after gales from the West, having the animal still in them. It has likewise been taken by Mr. Alder and Dr. Landsborough in Lamlash Bay.

„ bidentata. Occurs occasionally in rock-pools, as for example at the outer Allans, Cumbrae; and Clachland Point, Arran. It likewise may be found sparingly among Lamlash Bay shell-sand.

„ substriata. Fourteen examples fell to my lot from the spines of Spatangus purpureus taken off the west coast of Cumbrae. Dr. Landsborough several times met with it in Lamlash Bay (Lands. Excurs. pp. 195 and 322).

Turtonia minuta (*Montacuta purpurea*). By no means rare in rock-pools, if the Corallina be gathered and washed, and the sediment examined. The Allans, Cumbrae; and Clachland Point, Arran, afford it in some plenty.

*Kellia suborbicularis (*Mya suborbicularis*). Distributed throughout the district. The best situations to look for it in are the interiors of old dead bivalve shells filled with mud. The young may be taken occasionally in rock-pools.

„ rubra. Common, though somewhat local. Abundant among Balani which clothe the rocks just north of Fintry Bay, Cumbrae; and frequent in rock-pools, among Corallina officinalis and Lichina pygmæa, at Clachland Point, Arran. A white variety occurs in this last locality.

Lepton convexum. Lamlash, *Landsborough.*

„ nitidum. Mr. Webster has informed me that among a small quantity of Lamlash Bay shell-sand which I sent him he met with a single example of Lepton nitidum.

Fam. XVII. *Mytilidæ.*

*Mytilis edulis (*Mytilis pellucidus*). Abundant in the Clyde above Greenock, but further down it is by no means so, specimens being few and far between.

*Modiola modiolus (*Modiola vulgaris*). Frequently taken both at low water and with the dredge, but full-grown specimens are scarce, and I am not aware of any locality in which it occurs gregariously.

Modiola phaseolina. Lamlash, *Landsborough.*

Crenella discors (*Modiola discrepans*). The young very abundant among Corallina in rock-pools; large specimens, however, rare. A small stunted form is found at the outer Allans, Cumbrae.

* „ marmorata (*Modiola discors*). Ayr, *Smith.* Not rare within the tunic of Ascidia mentula. From a single specimen of this Ascidia, dredged at Cumbrae, I extracted no less than eleven Crenellæ, some of them very large, such as I have never seen except from the West of Scotland. Dr. Landsborough mentions that Major Martin has dredged this species near the Corriegills, "buried in the coriaceous coat of Ascidia rustica" (Lands. Excurs. p. 49).

„ decussata. Lamlash, *Landsborough.*

Fam. XVIII. *Arcadæ.*

*Nucula Nucleus (*Nucula margaritacea*). Common throughout the district in suitable localities: Largs, Fairleigh, Cumbrae, Rothesay, Lamlash, Ayr.

„ nitida. I have taken one or two specimens at Cumbrae, but it appears to be very rare. Bute, *Smith;* Lamlash, *Landsborough.*

„ radiata. "Lamlash, Arran (Alder)," *F. & H.*

* „ tenuis. Forbes and Hanley inform us that "this essentially northern species" occurs in the Clyde district. Mr. Smith records it from Bute, and Dr. Landsborough from Lamlash. It must, however, certainly be very rare, as it has never fallen to my lot to meet with it.

*Leda caudata (*Nucula minuta, Nucula rostrata*). Very rare. Clyde, Bute, *Smith ;* Lamlash, *Landsborough*). A single living specimen is now in my cabinet, which was dredged by Mr. W. Templer at Largs, and given me by Dr. Lowe.

* „ oblonga (*Nucula oblonga*). Ayr, *Smith.*

„ truncata (*Nucula truncata*). Ayr, *Smith.* On this and the last-mentioned species, admitted by Mr. Smith, of Jordan Hill, into his catalogue of the recent shells of the Clyde, Forbes and Hanley thus write:—"In consequence of the pleistocene tertiary beds of clay on the west coast of Scotland being often laid bare below low-water mark, fossil shells are frequently brought up in the dredge along with recent ones, and as often cast on the shore. Owing to their extremely fresh appearance, even the epidermis in many instances being preserved with its pristine colours and lustre, it is very difficult to say at a glance whether such specimens be not the exuviæ of animals yet living in the neighbourhood. This difficulty is yet further increased by the possibility which always exists of the species in question yet lingering alive (as indeed we have seen in the case of Leda pygmæa), in some limited tract or boreal patch in our seas. Until, however, such is proved to be the case, we cannot admit well-known and characteristic drift species into our list of living forms, and in this category we must place Leda oblonga (*Nucula oblonga*, Brown, Ill. Conch. G. B. p. 84, pl. 33) and Leda truncata (*Nucula truncata*, loc. cit. p. 84, pl. 33), both of which, however, are still found living in Arctic regions."—*F. & H.* vol. ii. p. 232, 233.

*Arca lactea. Two or three were taken some years since near the Corriegills, Arran, by Dr. Landsborough and Major Martin; but John Kelso (the boatman whom I would recommend conchologists to employ at Lamlash), who accurately described the shells, tells me that, though he has repeatedly dredged there since expressly for it, it has not since been met with.

*Pectunculus glycimeris (*Pectunculus pilosus*). Very local. Arran, Ayr, *Smith*. It occurs to the north-east of Holy Island in deep water, and there is also a series in the British Museum from the Island of Bute.

Fam. XIX. *Aviculaceæ.*

Pinna pectinata (*Pinna ingens*). "The Pinna ingens has only once, that I know of, been got at Arran."—*Lands. Excurs.* p. 60.

Fam. XX. *Ostræadæ.*

Lima subauriculata. I have met with single valves of this shell in Lamlash Bay, where Dr. Landsborough has also taken it.

„ Loscombii (*Lima fragilis*). A single valve near the Tan Buoy, Cumbrae. Bute, *Smith;* Lamlash, *Landsborough.*

„ trians (*Lima tenera, inflata* and *vitrina*). This is one of the most interesting Mollusca of the Clyde, and is abundant almost everywhere in the district among nullipore. Kelso tells me that when first Dr. Landsborough began to dredge at Lamlash, Lima trians could only be found in one confined spot in the Bay: it is now to be met with in all parts. Doubtless dredging has been the chief means in effecting this diffusion, since in overhauling the nullipore young specimens would, as the boat moved on, be thrown overboard here and there, and become the parents of a numerous progeny. Nothing can be more lovely than the animal of Lima trians; its thousand delicate and beautifully ringed vermilion tentacula, each maintaining, as it were, a life independent of its neighbour's, turning and twisting in every direction; the rich crimson foot and snow-white shell, form an object which, to my eyes, is unsurpassed among the British Mollusca. The animal has the power of darting itself through the water, by flapping the valves of the shell in the same manner as the Pectens. The economy, however, of this mollusk, as found in the Clyde district, is by no means the least interesting part of its history. At Herm I have taken it living free in rock-pools at the Galeomma ground, but in the Clyde it always inhabits a nest; I say always, because when specimens are found free I am of opinion that the circumstance is merely accidental, from the nest having been broken by the dredge, or from the Lima having voluntarily and temporarily quitted its usual domicile. The nest in which the Lima lives is frequently as much as eight or ten inches long; indeed, I think some which I have seen must have been a foot. It is formed of nullipore, stones, shells and sea-weeds, strongly fastened together by means of byssal threads; the interior is lined with a thick network of similar threads, the interstices being filled up with slime, so that it forms a smooth tube, in which the Lima takes up its abode, and where it is free from the attacks of fish and crabs, to assaults from which its widely gaping valves would otherwise greatly expose it. Here we see one of the many ways in which Providence provides for the safety of those Mollusca which, if unprotected by some artificial means, would be peculiarly open to attack. We have other instances in the boring powers of the Pholades and their allies, the rapidly burrowing abilities of the Solens, the curiously formed nest of Gastrochæna, and the great muscular power of the Patellidæ, which enables them to cling so tenaciously to the rocks. Forbes and Hanley "have never seen any but full-grown specimens contained in these curious nests;" they must have been singularly unfortunate, for I have repeatedly found the Lima of all sizes encased alike. There is but one thing I have to say against this interesting molluscan, and that is, the animal has a peculiar, tenacious, and, to me, sickening odour; after having handled a number of them it is no easy matter to remove the smell from the hands with soap and water, and so strong a hold has the nauseous smell sometimes taken on my olfactory nerves that a whole night has scarcely sufficed to remove the impression. Professor Balfour has informed me that the slime with which the nests are lined is very rich in Diatomaceæ, and that its examination will well repay the trouble of the diatomist.

*Pecten varius. Bute, Ayr, *Smith;* Lamlash, *Landsborough.*

„ niveus. Cumbrae, *Smith.*

*Pecten Pusio (*Pecten sinuosus*). Very far from common. I have taken two or three specimens moored to old shells in the laminarian zone to the west of Cumbrae, and as many more at Lamlash. Bute, Ayr, *Smith.*

„ striatus (*Pecten Landsburgii*, *spinosus* and *aculeatus*). This beautiful little scallop was first recognized as British in the Clyde, and described and figured by Mr. Smith in his paper in the Wernerian 'Transactions,' under the name of Pecten Landsburgii (Mem. Wern. Soc. vol. viii. p. 106, pl. II. f. 2) from specimens taken at Ayr. It is frequent in the district, and is generally found in about twenty fathoms. The channel between Largs and Cumbrae, the west of Cumbrae by Shell Bay and thence to Fintry, and a bed of rotten Pecten (opercularis) shells which lies a little to the south-east coast of Hamilton's Rock at the entrance to Lamlash Bay, are good localities. A specimen dredged at Lamlash was, when first taken, one of the most lovely shells I ever saw; its chocolate-brown ground-colour was sprinkled all over with flakes of azure blue; I am sorry to say, however, that this beautiful tint gradually paled, and that now the flakes are white. It is a very rare occurrence to find colour evanescent in a shell; indeed, this is the only instance that has come under my observation of a shell, in the cabinet, losing its colour.

* „ tigrinus (*Pecten obsoletus* and *lævis*). This Pecten is found in about equal numbers to the last, and in similar situations; Dr. Landsborough, however, mentions having "got, on the shore" at Catocol, at the north-west of the Isle of Arran, "some of the finest specimens he had ever seen of the beautiful Pecten obsoletus." I have an example from the Clyde of the "very charming and rare variation" mentioned by Forbes and Hanley, which "displays linear fillets of white upon a ground of reddish chocolate colour."

„ danicus (*Pecten nebulosus* and *Jamesoni*). The first British specimen of this shell ever taken was found at Cumbrae by Mr. John Blythe, of Glasgow, in 1835, and was described and figured by Brown, under the name of Pecten nebulosus, in the first volume of the 'Edinburgh Journal of Natural History,' page 49. Another variety, taken at Bute, was described by Mr. Smith in his paper on the recent shells of the Clyde, under the specific name of Jamesoni (Smith, Mem. Wern. Soc. vol. viii. p. 106, pl. II. f. 1). This Pecten lives in deep water among rocks; it is, therefore, difficult to procure it with the dredge; indeed, I have never done so, my specimens having all been procured from the fishermen, who now and then bring them up attached to the hooks of their long lines. Forbes and

Hanley give Loch Ranza, in forty fathoms, as a locality: my examples are from off Little Cumbrae lighthouse, the north of Great Cumbrae, and the east side of Holy Island.

Pecten similis (*Pecten tumidus*). The only locality in which I am aware of this shell being taken is among the old scallops of the bed to the south-east of Hamilton's Rock, Lamlash; I have there taken three living examples, and numerous single valves.

* „ maximus. Occasional in deep water throughout the district. Formerly abundant in Lamlash Bay, but, having been extensively dredged for the market, it has become scarce. Dr. Landsborough mentions a very large specimen taken at Cumbrae measuring "eight inches in length and seven and a half in breadth."

* „ opercularis. Very common, and in certain spots excessively abundant. There is a large bed of them extending from the Tan Buoy, Cumbrae, in a northerly direction, from whence they are extensively dredged for bait for the long lines. The most common painting in the district is rich brown mottled with white, or the whole of the costæ (not merely the summits as in lineatus) pink with the interstices white; rich yellow and orange examples are also not uncommon, but I have never observed pure white examples, nor the variety lineatus, among the thousands that have passed through my hands in the Clyde. The name by which the scallops are known in the West is "Clams."

* „ islandicus. "Is an abundant fossil in the pleistocene beds of the Clyde, and may be found in numbers at low water in the Kyles of Bute, as was observed by Mr. Smith, of Jordan Hill," *F. & H.* "Pecten islandicus, which is regarded as a rare shell, is found in considerable plenty in winter and spring on the shore of Fintry Bay, but these are always dead, and I doubt not from some post-tertiary deposit."—*Lands. Excurs.* p. 420. It is probable that the deposit from which this shell was thus washed up some years ago in Fintry Bay is now exhausted, as a single broken valve is all that has rewarded my repeated search in that locality after gales. There can be no doubt but that all the examples of this shell which have been taken in the Clyde, either with the dredge or otherwise, are fossils, comrades of Panopæa norvagica and Tellina proxima, the characteristic forms which inhabited the waters of the Clyde during the glacial period.

*Ostrea edulis (*Ostrea parasitica*). I am not aware of any spot in the Clyde where oysters are sufficiently abundant to reward the dredger for his trouble in procuring them; a few, but only a few, may occasionally be taken off Fairleigh, and in other widely distant parts.

The variety parasitica occurs at Lamlash, and may be procured also from the rocks, at low-water mark, in Balloch Bay, Cumbrae.

*Anomia ephippium (*Anomia squamula* and *cylindrica*). Never occurs of large size, the variety squamula being the most common form.

* „ aculeata. Rare. Bute, *Smith ;* Cumbrae, Lamlash.

* „ patelliformis (*Anomia undulata*). Very rare. I have only procured two or three specimens.

„ striata. I have formerly sent this shell to many of my correspondents under the name of "patelliformis." My attention was kindly called to its being the true striata by my friend Mr. Webster. I have little doubt in my own mind as to the specific identity of these two shells, believing that the modifications which their form assumes are merely due to local causes of food and habitat. I am far, however, from prepared to go the length of Mr. Clark, who, taking up his position solely on malachological grounds, would unite all the British Anomiæ under one species; indeed, in order to reconcile the malachological differences which exist between the species, Mr. Clark is driven to compare a few isolated specimens of the young of patelliformis with full-grown ephippium. Anomia striata is abundant in the Clyde, and is found for the most part attached to the interiors of Pecten shells, though now and then living on the exterior; and in some localities (as outside the Bay of Lamlash) it lives upon stones. Examples from these last situations are not developed so evenly in all their parts as those found in the interior of bivalves, and present a rougher and coarser aspect; some now and then living on the edges of stones, and not having room to develope themselves, assume a tubular saddle-shaped form.

Div. III. PALLIOBRANCHIATA.

Fam. I. *Terebratulidæ.*

Terebratula caputserpentis (*Terebratula aurita*). The only locality which has at present yielded this species in the Clyde is around Holy Island, more especially to the north-east, and between that and Hamilton's Rock. Clyde specimens are smaller, more ventricose, and have the costellæ larger and fewer in number than is usual in those taken among the Hebrides.

Fam. II. *Craniadæ.*

Crania anomala (*Orbicula norvegica, Crania norvegica* and *personata*). This remarkable bivalve (which it is impossible to make a bivalve of if it be removed from the stone or shell to which it adheres, since the under valve is a mere layer of shelly matter insaperably united to the substratum) is common in the deeper parts in and outside of Lamlash Bay. I have also taken it, though less frequently, to the west of Cumbrae, and in other parts. The largest examples from the Clyde do not exceed half an inch in diameter.

Errata in the previous Part.—Page 5711, line 5, for "*Apatinidæ*" read "*Anatinidæ*"; line 22, for "*Amphidesma convexa*" read "*Amphidesma convexum.*" Page 5712, line 15, for "pellucidens" read "pellucidus." Page 5713, line 31, dele "I have" to "appears scarce"; line 34, for "*compressa*" read "*compressum.*"

ALFRED MERLE NORMAN.

Kibworth, Leicestershire,
October 28, 1857.

(To be continued).

Note on the Theory of Permanent and Geographical Varieties.

By ALFRED R. WALLACE, Esq.

As this subject is now attracting much attention among naturalists, and particularly among entomologists, I venture to offer the following observations, which, without advocating either side of the question, are intended to point out a difficulty, or rather a dilemma, its advocates do not appear to have perceived.

The adoption of permanent and geographical varieties has this disadvantage, that it leaves the question "What is a *species?*" more indeterminate than ever; for if permanent characters do not constitute one when those characters are minute, then a species differs from a variety in degree only, not in nature, and no two persons will agree as to the amount of difference necessary to constitute the one, or the amount of resemblance which must exist to form the other. The line that separates them will become so fine that it will be exceedingly difficult to prove its existence. If, however, the two things are of essentially distinct natures, we must seek a qualitative not a quantitative character to define them. This may be done by considering the permanence, not the amount, of the variation from its nearest allies, to constitute the specific character, and in like manner the instability, not the smaller quantity, of variation to mark the variety. In this way you define the two things by a difference in their nature; by the other, you assert that they are of exactly the same nature, and differ only in degree.

Now the generally adopted opinion is that species are absolute independent creations, which during their whole existence never vary from one to another, while varieties are not independent creations, but are or have been produced by ordinary generation from a parent species. There does, therefore (if this definition is true), exist such an absolute and essential difference in the nature of these two things that we are warranted in looking for some other character to distinguish them than one of mere degree, which is necessarily undefinable. If there is no other character, that fact is one of the strongest arguments against the independent creation of species, for why should a special act of creation be required to call into existence an organism differing only in degree from another which has been produced by existing laws? If an amount of permanent difference, represented by any number up to 10, may be produced by the ordinary course of nature, it is surely most illogical to suppose, and very hard to believe, that an amount of difference represented by 11 required a special act of creation to call it into existence.

Let A and B be two species having the smallest amount of difference a species can have. These you say are certainly distinct; where a smaller amount of difference exists we will call it a variety. You afterwards discover a group of individuals C, which differ from A less than B does, but in an opposite direction; the amount of difference between A and C is only half that between A and B: you therefore say C is a variety of A. Again you discover another group D, exactly intermediate between A and B. If you keep to your rule you are now forced to make B a variety, or if you are positive B is a species, then C and D must also become species, as well as all other permanent varieties which differ as much as these do: yet you say some of these groups are special creations, others not. Strange that such widely different origins should produce such identical results. To escape this difficulty there is but one way: you must consider every group of individuals presenting permanent characters, however slight, to constitute a species; while those only which are subject to such variation as to make us believe they have descended from a parent species, or that we know have so descended, are to be classed as varieties. The two doctrines, of "permanent varieties" and of "specially created unvarying species," are inconsistent with each other.

Alfred R. Wallace.

On the Entomology of the Aru Islands.

By Alfred R. Wallace, Esq.

Almost all that is known of the insects inhabiting New Guinea and the adjacent islands is due to the French naturalists attached to the numerous discovery ships which have visited that part of the world. Many fine things have thus been made known to entomologists, although the total number of species collected is very small; and it may, perhaps, be considered as one of the least known and most promising regions that remain, now that the most remote parts of the earth are ransacked by enterprising collectors. These considerations induced me to make a voyage to Aru in one of the native prows which trade there annually, going with the west monsoon in December, and returning with the east in June. I expected that these islands lying so near New Guinea, and known to have some of their most interesting animal productions (the birds of paradise for example) identical, would yield me many New Guinea forms, and probably some identical species, and my expectations in this respect have been fully realized. The Entomology, the Ornithology, and certain peculiarities in the physical geography of these islands, prove to me that at no distant period (geologically) they formed a portion of the southern peninsula of that great island, and have been separated from it by a depression of the intervening portion (now a shallow sea), they themselves remaining almost or quite undisturbed. I believe, therefore, that the insects of Aru and New Guinea are as closely related as those of Great Britain and the Continent of Europe.

It was with considerable anxiety that, on January 8th, 1857, I took my first walk into the forest. The first insect I saw was not a very encouraging one: it was the common Diadema Ange, found over the whole Archipelago. A little further, however, and I was rewarded by Idea d'Urvillei, a beautiful Hyades, the lovely Damis Coritus, *Guér.*, and that superb insect Cocytia d'Urvillei. Two or three pretty Lycenidæ of genera unknown in the western parts of the Archipelago, Tricondyla aptera, and two species of the longicorn genus Tmesisternus, with several smaller insects, composed my first day's sport; and a very satisfactory one it was, for it assured me there was work to be done, and that I was really in the midst of a New Guinea Fauna.

I collected steadily for two months in this jungle, situated in the small island of Wamma, at one end of which is the Bugis settlement of Dobbo, where I resided. I got a great many nice things, but the species were very limited in number, and a new one began to be a rarity. With all my exertions I could only muster 90 species of butterflies and 235 Coleoptera at the end of one month, which had increased to 108 and 340 in two months, with 150 Hymenoptera, 120 Diptera, and other orders scanty, making a total of 850 species of insects. Even this I believe is considerably more than all the New Guinea species yet known. Among my butterflies the finest thing was a superb Ornithoptera, differing very slightly from O. Poseidon of Doubleday. Females of this were abundant, some measuring 9½ inches across, the males scarcer and much more difficult to capture, so that I hardly got a really perfect specimen. The excitement of chasing this glorious insect may be imagined. The fine Papilio Euchenor, *Guér.*, was also by no means uncommon, but very difficult to take, having a wild zigzag moth-like flight. P. Ormenus, *Guér.*, was also often seen, but as rarely taken. Of a new species, near Ægistus, I got but a single specimen, and never saw another, and the rare and magnificent P. Ulysses I saw almost daily, without even a chance of obtaining a specimen. A Hamadryas, perhaps H. Zoilus, is one of the commonest of the forest butterflies, and, from its weak flight, most easily taken: It has all the appearance and habits of the Ithomiæ of S. America. Five or six species of Euplœa, and as many of Pieris, are abundant, some pretty little Satyridæ, and from 20 to 30 species of Lycenidæ and Erycinidæ, many of which will bear comparison with the loveliest gems of the Amazonian forests.

Among the Coleoptera the most remarkable things were six or seven species of Tmesisternus, a fine Gnoma, and a new genus allied to Golsinda, the males of which have the anterior coxæ armed with a long acute spine. The Curculionidæ contained several very fine Anthribidæ, one, the giant of the family, being near an inch and a half long, with very long legs and rather short antennæ; some singular Brenthidæ, the curious Arachnobos Gazella (Bois. Voy. de l'Astrolabe, t. 7, fig. 22), and a beautiful blue and black banded Curculio. Lamellicornes are almost absent from this region: nine species of the whole tribe were all that two months' work produced, and of these half were single specimens only. There is probably no other country where this extensive group is so near to being altogether absent. Two fine species of Lomaptera, however, are among this little lot,—I think both new: they fly about in the jungle near the ground, with a loud humming noise, and settle on rotten wood, never on flowers, except at the opening spathes of the cocoa nut: they are very shy, and take flight so suddenly, keeping among thickets and rotten branches of fallen trees, that it is very difficult to capture them. Almost all the other interesting groups are very scarce: Buprestidæ, 12 species; Lucanidæ, 1 species; Geodephaga, 12 species; each producing one or two good things, the rest small and obscure.

Having at length, with the greatest difficulty, procured a boat and men, I went to the great island of Aru, in which I visited two localities and remained two months. Here were numbers of species not found on the smaller islands, and I increased my collection considerably. In the Lamellicornes and Buprêstidæ, however, I did not get a single new species, almost all my increase being confined to the Longicornes and Rhyncophora. I doubled my species of Tmesisternus, which is quite a characteristic of the New Guinea Fauna, and I was delighted to obtain T. mirabilis, the largest and most beautiful of the group, in tolerable plenty. I also added some nice butterflies to my collection, and at length succeeded in obtaining two nearly perfect males of Papilio Ulysses. Mosquitoes and minute ticks here attacked me so perseveringly, that my feet and ankles refused to submit, and, breaking out into inflamed ulcers, confined me to the house during a month of the very finest weather, when I had hoped to obtain and preserve a host of fine insects, for the incessant rain and damp sea air at Dobbo had rendered it impossible properly to dry my first collections, a great part of which was, I afterwards found, completely spoiled. In no part of the tropics have I suffered so much from damp, or found it so absolutely impossible to preserve my collections, though exposing them to every gleam of sunshine, and even to fire heat, which, however, is of little use in bamboo houses which freely admit the damp air in every direction. Returning to Dobbo I remained a prisoner for another month, before I could again reach the forest. I then worked hard for the remainder of my stay, adding many fine Hymenoptera and Lepidoptera to my collections.

Arriving safe at Macassar, and taking up my old quarters, I had a most fatiguing task,—to open out, clean and pack my collections (more than seven thousand specimens), which occupied my whole time for three weeks. I was now able to ascertain my total number of species in each order, and to determine the identity of many with those described by Guérin and Boisduval from the French voyages. These are very numerous, so much so that I think at least half of the known insects from New Guinea will be found in my Aru collections, which is not a little remarkable, considering that they have been obtained from various and distant localities in that extensive country: for instance, nineteen species of Tmesisternus are known, all from

New Guinea and the adjacent islands. I have obtained exactly the same number in Ké and Aru: ten of these I can identify, the other nine being, I think, new. About twenty other Coleoptera peculiar to New Guinea I can also easily identify, and no doubt many others among the small and obscure ones will also be found to be already known from that country. In Lepidoptera I have four of the New Guinea Papilios, Pieris Celestina, *Bois.*, Satyrus Osiris, *Bois.*, Emesis Leosida, *Bois.*, Damis Coritus, *Guér.*, D. Sebæ, *Bois.*, and four or five other species, besides many beautiful Lycenidæ, which will be, I think, quite new. In Hymenoptera and Diptera I am very rich, having bestowed much attention on these orders. Fifty-nine species of ants, collected in Aru, will add much to our knowledge of the distribution of this interesting family. Of other Hymenoptera there are 155 species, many of them large and fine. The flies contain many brilliant and many curious things, and I am rather proud, amid the attractions of Ornithopteræ, Lomapteræ, and Paradise birds, of having collected 185 species of this much-neglected order; and there are yet, I am sure, many more of moderate size, and hundreds too minute for any but a professed dipterist to attend to.

Deducting the time lost by illness and in travelling, I had about four months' clear collecting; and I think I cannot do better than give a list of the number of species obtained in the principal groups, so that English entomologists may see what a New Guinea island does really produce.

Coleoptera, 572 species, viz.:—

Geodephaga	20	Prionidæ	2
Hydradephaga	3	Cerambycidæ	35
Brachyelytra	6	Curculionidæ	92
Xylophaga, &c.	20	Bruchidæ and Anthribidæ	35
Lamellicornes	18	Brenthidæ	18
Lucani	3	Heteromera	42
Passali	6	Cleridæ	16
Buprestidæ	23	Malacoderma	45
Elateridæ	30	Cyclica	68
Lamiidæ	77	Trimera	13

Lepidoptera, 229 species, viz.:—

Papilionidæ	16	Erycinidæ	2
Pieridæ	12	Lycenidæ	57
Satyridæ	9	Hesperidæ	18
Nymphalidæ	33	Moths	72
Danaidæ	10		

And of the following, 563 species, viz.:—

Hemiptera	80	Orthoptera	18
Homoptera	50	Neuroptera	10
Hymenoptera	214	Forficula, Blatta, &c.	6
Diptera	185		

Total species of insects . . . 1364

In the Lepidoptera and Coleoptera it will be seen there is a striking deficiency of species. In both Singapore and Borneo I obtained, in the same time, more than twice as many beetles, while in South America either of the families of Erycinidæ or Hesperidæ far outnumber the whole amount of the Aru butterflies. Such poverty is a great drawback in this otherwise interesting country, and, were it not that there are a few remarkably fine things, and a considerable proportion of the species are either new or very rare, it would not be worth a collector's while to remain in it. There are scarcely twenty butterflies of which I have been able to obtain tolerable series of good specimens. I am now convinced that the number of species of butterflies diminishes from continental India, as you go eastward. In Java and Borneo there are less than in India and Borinah, in the Moluccas and New Guinea still less, and in the Islands of the Pacific scarcely any. The same rule probably holds in Coleoptera, though of that I am not so sure till I have seen more of the country, as peculiar circumstances of station and locality make a great difference in that order.

I should mention that, in the above list, I have included about 90 species of various orders taken in a few days at Ké Island, 60 miles west of Aru. In no part of the tropics I have visited has so much care been required to preserve my collections as in the eastern portions of the Indian Archipelago. Three or four distinct species of ants are ever on the watch for soft insects, which they find out and attack with the most astonishing celerity: two of these are very minute and will *not* be banished. They struggle over water, drop from the roof, and lurk in cracks and crannies where it is impossible to dislodge them; and again and again have my specimens of minute Diptera and Lepidoptera been destroyed by them. The larger species are more easily kept out, but far more destructive when they do effect an entrance, and they never miss an opportunity. A hanging shelf isolated by oil had kept my drying box more than a month in safety, when one morning I found it swarming with red ants, and several fine butterflies taken the day before being carried away piecemeal. Searching for the bridge by which they had reached my fortress, I found that my Malay boy had carelessly thrown a palm-leaf mat behind the shelf, the corner of which just touched it, and now presented a double line of entering and returning ants. I called him to see the mischief he had done, and then, putting all right, went into the forest, and had a successful day, obtaining several fine and some new butterflies. At night, before going to bed, I carefully examined all round my shelf, but the next morning the enemy had again entered; again my fine insects were being carried away piecemeal, and I was only just in time to save one lovely and unique butterfly from total destruction: again I searched,—for a ladder I knew there must be,—and found my unlucky boy had again done the mischief: he had been roasting coffee for our return voyage, packed it in a jar, and tied to it a long slender rattan, by which to secure it on board; this he had placed on the floor under the shelf, with other sundries, and the rattan sticking up its extreme point just touched the shelf beneath. One would think the ants must every night explore and wander everywhere, for they never fail to discover even a hanging thread by which to ascend. In no other place have they attacked my birds as well as my insects. In all parts of South America, in Malacca, in Borneo, *they* at least were safe on a table or in a box; but in Macassar and at Aru they are attacked as voraciously as the insects, and even greater precautions are necessary, for the ants establish colonies inside the skins, whence they sally out to devour the eyelids, the base of the beak, &c., and completely destroy the beauty of the specimens. Here, too, it is impossible to keep the insect-boxes free from minute spiders which make webs over and under the specimens, and often gnaw them. Then there are some minute larvæ which attack large-bodied Lepidoptera, mining out their bodies, and reducing them to a mass of dust which dirties every specimen in the box; and lastly are the mites, which the damp sea air of these islands seems especially adapted to develope. Long and sad experience of this pest has convinced me that there is but one preventative, viz. to dry the specimens rapidly, which it is often impossible to do, and then neither camphor, arsenic, nor cajeput oil, have any effect whatever. Add to this that everything must be shut up at night in closely fitting boxes, or the insects will be eaten by cockroaches and the bird-skins by rats, and some little idea may be formed of a collector's troubles in the damp climate of Aru, while living in a half-open bamboo shed, surrounded by his daily increasing stores of beautiful objects, which the most incessant vigilance can hardly preserve from destruction.

ALFRED R. WALLACE.

Notes on Anisolabia maritima, Bon.

By George Wailes, Esq.

In the early part of the past summer Mr. Bold showed me for a few minutes two specimens of what he considered the larvæ of the rare Forficula gigantea, which he had found a few days previously on the sea banks near South Shields, underneath stones at the foot of some ballast heaps he had been accustomed to examine for Coleoptera, and where he took Nitidula flexuosa, as recorded by him (Zool. 5111). I at once pointed out appearances which led me to infer that this was an error, and determined to wait until autumn, when all our Forficulæ complete their metamorphoses and arrive at maturity, and then investigate the subject. Accordingly, on the 22nd of September last, I visited the locality, and soon met with the insects in abundance and of all sizes, and, being well aware how fragile their delicate antennæ were, I took the precaution to collect them into a bottle of spirits of wine. From what I saw upon the spot I was convinced that, although there were no traces of wing covers, I had perfect insects of both sexes, and not merely larvæ, before me, and on my return home in the evening settled the fact anatomically. I was aware that no work on British Entomology contained a genus to which it could be referred, and therefore turned to Burmeister's second volume, as the latest descriptive authority I had at hand, and found that no description or even section would include this species. I forwarded, therefore, a specimen to my friend Mr. Westwood, stating that I expected I had got something new, and his reply was that he had no doubt it was the Forficula maritima of Bonelli and Géné, Forficesila maritima of Serville, and the Anisolabia of Fieber. On referring to Fieber's little work I was satisfied that he had had this insect in view (though certainly mutilated specimens) when he defined the genus, but as I did not then possess Serville's work I could not determine it to be the maritima of Géné; and on again consulting Burmeister, who professes to include the species of Géné's pamphlet, I found not the least allusion to it. Having in the interim added Serville's book to my library, I observe the species very well described. According to Géné it is widely diffused, at the end of spring, along the shores of the Mediterranean, Genoa, Nice and Tuscany, under stones and cow-dung, though it would seem not to be confined to the sea-shore, as Serville mentions it to have occurred on Mount Lebanon, and Fieber adds Sardinia and Sicily and South Carolina to its habitats.

Having collected a considerable number of specimens, in all stages of growth, I have been induced to examine them, with a view of assisting to clear up certain points, which appear to be yet unsettled, as to the metamorphoses of this curious family of insects. The result I now give.

I may premise that even so late as the end of September there were specimens in apparently their earliest stage, and just disclosed from the egg, as I took one not more than two lines long (I speak *exclusive* of the forceps in these notes), which Mr. Westwood gives as the size of the corresponding stage of F. auricularia. In this state it seems to agree with that insect in having only eight joints to the antennæ, of which the second (as in all its future stages) is the shortest, and the third the longest, except the basal joint. The remaining five are of nearly equal length; the fourth is similar to the third in being smoother than the four last, which are of the same shape and densely pubescent, as in the terminal ones of all the future stages. The palpi consist of five joints as in the imago, and the prothorax, mesothorax and metathorax have all the shape and are as fully developed as in the perfect insect. The head and eyes are large, the latter black and prominent. The abdomen consists of nine segments both on the upper and under sides, and the integument is very soft, of a pale brown colour, with the apical segment of the abdomen and the forceps nearly transparent. The latter has the straight form of the female insect, and the tips slightly curved. The scattered hairs with which the perfect insect is furnished, both on its upper and under surface, are also present.

In what I take to be the next stage the length has reached 3¼ lines. The joints of the antennæ have increased to sixteen; the additional ones have assumed something of the various proportions they are henceforward to bear. They are evidently developed after the third joint, and probably at the expense of the fourth one of the first stage, as the four terminal joints still retain their former shape and dense pubescence. The segments of the abdomen are nine as before, and the forceps continues of the previous shape. Towards what may be termed the latter period of this stage the integuments assume the pitchy brown colour and nearly the consistence of the perfect insect.

On what is apparently the next transformation the insect attains the length of from 5 to 5½ lines. The antennæ contain twenty joints, though from this period the "wear and tear of life" renders it very difficult to ascertain this precisely, as from their extreme delicacy the point of junction can scarcely be seen even through a good lens; and in very many cases the two antennæ differ in this respect in the same individual. The number of the segments of the abdomen remains as before, and the forceps has undergone no change except an increase in size.

In the next stage, when the length varies from 6½ to 8 lines, the first faint indications of sex appear. The antennæ have now reached twenty-two joints; indeed, one specimen (an incipient male) had twenty-three joints in one and twenty-two in the other antenna, of both of which the terminal joint was *certainly* perfect. The number of abdominal segments in all the specimens still continues to be nine, but the forceps, in such as I presume are to be developed as males, has become much thicker at the expense of its length, though the basal tooth possessed by the mature insect is yet wanting. The whole of the specimens have during the last two changes so completely assumed the colour and appearance, and in many examples even the size, of the perfect state that at first sight they might readily be mistaken for small mature females.

On the final change there is no longer any doubt of their maturity. The antennæ of two or three specimens, out of probably a hundred, I have ascertained to consist now of twenty-three joints, but I think this is not the maximum when really perfect, for the apical joint in one or two instances bears *certain* marks of not being the terminal one when submitted to a powerful compound microscope. A considerable number of my specimens possess twenty-two joints in one or other of their antennæ, but the bulk of them range from twenty-one to nineteen, and many even fewer. These have all undoubted traces of mutilation. As before remarked, they are not seldom dissimilar in the same insect. Fieber gives seventeen as the number; Serville says, "more than twenty." The antennæ may be described as filiform, or tapering very gradually towards the apex. The first joint oblong-ovate, narrowed at the base, as long as the second, third and fourth taken together, rather smooth, with a few scattered hairs; the second very short, almost quadrate or even transverse, slightly pubescent; the third elongate, not quite so stout as the second and three times its length, and, like the twelve following ones, slightly contracted at the base and pubescent; the fourth short, but rather longer than the second; the fifth short, a little longer than the fourth; the sixth and following six or seven gradually increasing in length, after which the remainder are linear and as long as the second and third united, and the terminal ones very closely and very densely pubescent. The abdomen of the male still retains the nine segments, and the forceps has become greatly curved, so that the two points overlap each other, forming a ring when closed, and having a strong tooth at the base on each side. In the female the abdomen now *apparently*—for Mr. Westwood has clearly demonstrated that it is only in appearance—consists of seven segments above and only six beneath, and the forceps retains its simple elongate form, having the internal edges slightly crenulated by a row of impressed dots along the edge, whilst the hook at the apex becomes a little more curved.

I cannot be sure that the above are all the changes these insects undergo, as that can only be clearly settled by rearing a single brood from the eggs, and tracing them up to maturity; but I believe I am correct, as all the specimens readily corresponded, both as to size and the number of joints in the antennæ, where perfect, with some one or other of the above stages of growth.

These observations appear to me to solve the question as to the period at which the change in the visible number of the segments of the abdomen, amongst the Forficulidæ, takes place; and although there are certainly faint indications by which the sexes may be distinguished in the penultimate state, yet I think we may safely conclude that, so far as those insects are concerned, no propagation takes place until the ultimate stage is reached.

I may now say a few words as to the locality in, and the circumstances under which the insect occurs with us. Every one who knows the Tyne is aware that it is an exporting port, and in return for the coals we send away we receive the stones, gravel and soil of almost every part of the globe, in the shape of ships' ballast, and in such quantity that huge mounds, of the aggregate length of several miles, may be found piled up forty or fifty feet high along its shores. It is at the base of one of these mounds, containing many millions of tons, which has been in the process of deposit for several years past, and abuts upon the sandy sea-shore, although far above high-water mark, that the insect is to be met with in great abundance, underneath the stones, vitrified scoriæ from the glass and alkali works, &c., which roll down from above and rest upon the bare sand. I have noticed that it very frequently clears out for itself cells in the sand underneath the stones, as the common earwig does, though, as might be expected from the lateness of the season, I did not observe any appearance of the females brooding over their young, or having them gathered around them as we constantly see in our native species. I am fully persuaded that this inhabitant of more southern climes is not truly indigenous, but, being peculiarly fitted for a long sea voyage, and finding itself landed on a favourable spot, it has, like many other insects and plants, become perfectly naturalized amongst us. Can this be the way it has reached South Carolina?

I may further add that so late as the 13th of November it was, including specimens of three lines' length, in full activity, whilst our common earwig is dormant, proving it quite capable of bearing our northern climate, which doubtless it has done for several years past.

George Wailes.

Newcastle-on-Tyne,
November 19, 1857.

A Proposal for a new Catalogue of British Coleoptera.

By J. W. Douglas, Esq.

The Entomological Society of Stettin has recently published the sixth edition of the 'Catalogus Coleopterorum Europæ,' or Catalogue of the Coleoptera of Europe. This publication serves the coleopterists of Europe as a guide for naming and arranging their collections, and is used also for facilitating exchange of specimens. That it is not complete or entirely accurate none know better than the compilers, for each succeeding edition contains additions to and emendations of its predecessors; but notwithstanding its imperfections it is accepted as the best thing of the kind procurable, and is found to answer all practical purposes. The best thanks of entomologists are accorded to the Stettin Society, under whose auspices and at whose cost this Catalogue is brought out and sold at the price of sixpence per copy, thus placing it within the reach of every one.

Now, it does seem strange that, while we have a Catalogue of the Coleoptera of Europe, we have not one of the Coleoptera of Britain. It might have been supposed, seeing the species found in Britain are, with few exceptions, common to the Continent, that it would be easy to select our natives from the European list; but, unfortunately, the nomenclature hitherto used in this country differs materially from that accepted abroad, so that to a great extent we cannot recognize our species under continental names, nor can continental entomologists understand what species are intended to be indicated by our English names. The difficulty is further increased by the fact that we ourselves are often unable to tell any better than a foreigner what our species are, for a variable species often figures under a dozen different names, and foreign descriptions have been translated, and, with the names, applied to insects to which they do not belong. To disentangle this web of synonymy is no easy task, and is necessarily a work of time: some of our best coleopterists have applied themselves to it, and are still engaged upon it, and we may eventually have our lists in accordance with those of the Continent.

But in the meantime the want of a cheap compendious Catalogue of Coleoptera is a great drawback to collectors in this country. I do not say this without reason, or merely from my own experience, for I have had many letters pointing out that the writers cannot accept offers of species not British, because they cannot inform their correspondents abroad what species are natives of our island, and also that the arrangement of their British collections is retarded. I know it is said that many persons think too much of making collections, and it is true; but if we assist them in so doing we shall all have more material to work on for elucidating the natural history and geographical distribution of species, and perhaps induce the persons in question to become something more than collectors.

The thing that requires to be done in the present stage of affairs, and pending the investigation of synonymy in those families where it has not been revised, is, that those persons who have specially studied the several families should mark off the species in the Stettin Catalogue which they know to be British (and I believe that to more than one such a work would not be difficult), filling up the gaps where all are at fault with Stephens' names, and take the list thus prepared as the beginning of a new British Catalogue. Synonyms need not be added, because part are already given in other works; the remainder would follow, and collectors would soon learn to what species the names adopted were to be applied. Such a work I have reason to know would be received with favour, notwithstanding its faults, and in a year or two we should be able to bring out another edition correcting many of the errors. This is the course that was pursued with the British Micro-Lepidoptera, and the result is that within a few years we have assimilated our nomenclature to that of Germany, and no longer stand in isolated ignorance. There is no cause to doubt that those most capable of doing the work will give the requisite assistance; nor can I for a moment entertain the idea which has been started, that there are persons who would like to see it done only for the pleasure it would give them to cut it to pieces and show its errors. But, doubtless, if such a course were pursued it would be beneficial to us, although the spirit that dictated it would be very mean.

This work is one that the Entomological Society would do honour to itself in performing; indeed, it was once proposed to be done under its sanction, but was taken out of its hands by an offer to produce a more complete Catalogue, which, however, we all now fear is not likely to be soon accomplished. But, as large bodies are slow to move, and there may be an unwillingness that the Society should countenance a work confessedly incomplete, it may come better from private hands. After all, I think it would be found that the knowledge possessed by such proficients as Dawson, Clark, Janson, Waterhouse, Wollaston, Power and others, if united, would leave comparatively little to be desired.

To recapitulate:—It is required that, taking the Stettin Catalogue as the basis, a Catalogue of the British Coleoptera, without synonyms, should be prepared without delay, and published at such a low price that every one interested could buy several copies, so as to secure the promoters from loss. The good work of revision, so well begun by several persons, could still go on; in a year or two another edition would be called for, and after a repetition of the process, as in the example of the Tineina before quoted, we should have a list worthy of the name of a Catalogue of British Coleoptera.

J. W. Douglas.

Lee, November 30, 1857.

An Entomologist's Visit to the Diggings.

By T. J. R. Oxley, Esq.

Influenced partly by the love of gain, and partly by an insatiable desire of collecting insects previously unknown, I determined, immediately after the loss of an only parent, to visit the gold diggings of Australia. Taking with me three assistants, I left Gravesend on the 14th, and Plymouth on the 20th of May, and sailed for the El Dorado of the antipodes. We had an average passage, the weather being generally favourable. One serious incident occurred, which I may be excused for mentioning: when near the equator we came into collision with a homeward-bound ship, and ran some risk of going to the bottom. On the hundredth day we anchored off Williamstown, and a few days afterwards landed at Melbourne.

On the 7th of September I started, with my three assistants and several shipmates, for the Diggings: we left Melbourne on foot, and, the roads being excessively muddy and slippery, we found that mode of progression painful and laborious in the extreme. At Keilor we came to a river, which we crossed in a most antediluvian-looking punt, and passed the night in wet clothes on the stone floor of a hut: on the 8th we crossed Keilor plains, then a regular sea of mud and water, keeping in sight a most picturesque-looking mountain peak, which rose many miles distant on the south-west. We passed close to some remarkably deep water-courses on the right, and particularly noticed a curious little conical hill, covered from its summit to its base with honeycombed boulders, the substance somewhat resembling pumice stone, but being much heavier. We reached Aiken's Gap at night, after a most fatiguing walk of fifteen miles, and there at last found ourselves in comfortable quarters. During this wearisome journey I observed hundreds of large caterpillars at rest on the blades of grass, or devouring them. A croaking or chirping sort of noise was heard throughout the day: it seemed to proceed from the innumerable little pools of water which lay in our course, and we attributed it to the frogs, but of the truth of this explanation we had no evidence.

On the 9th we set out for a coffee-house near Mount Macedon, a distance of seventeen miles, most of our course laying through the Black Forest, in passing through which we observed thousands of gum trees lying on the ground, deformed and charred by a fire which had swept the whole country, in February, 1849, on a day which has since been called Black Thursday: thousands of others, of all sizes and ages, which had escaped the conflagration were still standing. In the midst of rain, and ankle deep in water, we lost the track, and, in our attempts to regain it, walked in a circle for hours, fording a small river five different times. At last we reached a shepherd's hut, where I left most of the party, and pushed on with an old friend to his home near Mount Macedon, which we reached at length after a walk of twenty-five miles. At night when I pulled off my boots the skin of my heels came with them, and inflammation followed on this, which made it impossible to proceed. We took up our abode in the remains of a shepherd's hut, which was sufficiently roofed to keep out the rain. We spread Eucalyptus leaves on the ground, and, covering them with blankets, made ourselves beds, and used logs of wood for pillows. The fatigue we had undergone, combined with the bad water, bad mutton, and other bad things we got at this place, caused dysentery, which brought us all very low, but from which we eventually recovered.

Whilst staying here I contrived, with the aid of a staff, to hobble from tree to tree, and amused myself with observing the curious Coleoptera which the sun, when it shone, tempted from their winter hiding-places. One of these, of the genus Amarygmus, one of the Heteromera, with brilliant metallic shades of green and purple, was peculiarly beautiful: the beetles of this genus I afterwards found everywhere; they are common all the year round.

We were not long in Australia without finding that the climate was very peculiar, days of soaking rain being followed by frosty nights, which often cover the pools with ice half an inch thick. Three hours after sunrise all this would be melted, and the temperature would become so warm that exercise would produce a profuse perspiration. In the morning I used continually to start up, from the wet or hoar-frosted grass, lepidopterous insects, particularly beautifully marked Geometræ, and I was both pleased and amused to observe how much the colours and markings of some of them resembled those of our English ones. A small blue Polyommatus, which had survived the winter, was also plentiful. Birds were most abundant, although thousands of gold diggers had passed and repassed the place where I was staying: they were mostly of the parrot tribe, and were remarkably tame; numbers of magpies and laughing jackasses would come within thirty yards of me, and the beautiful satin bird would actually come into the hut and pick up its food while I was sitting by the fire: this occurred several times, and on one occasion two of them came in company. I may here make a general remark, that the birds and animals of Australia appear much more readily tamed and domesticated than with us, being readily reconciled to captivity, and evincing such attachment to man as really to induce the conclusion that they prefer an artificial to a natural state. I saw many cockatoos shot, and always regretted to see such lovely birds destroyed for so little purpose: it must, however, be said that they are excellent eating.

I had an opportunity of examining a laughing jackass, holding it in my hand and observing its peculiarities: it lives on reptiles, and nothing could be better adapted for this kind of life; it has scarcely any flesh, its body being remarkably light, and so thickly covered with feathers that it seems almost all feathers; there seems nothing about it that a reptile could bite; its beak is very large, pointed, and enormously strong, and with this it will seize a large snake, and, regardless of its writhings and attempts to bite, will rise high in the air, and, letting its prey fall from a height that is always fatal, it will then descend and make an undisturbed meal of its senseless victim: on contemplating this bird, I was particularly struck with the wisdom that had created a form and powers so admirably adapted to its mode of life. The neighbourhood in which I was living abounded in the diamond snake, one of the most deadly of reptiles: on the 16th of September I assisted in killing a large female of this species, four feet in length and as thick as my arm.

On the 23rd we bade adieu to Mount Macedon, and turned our faces towards Mount Alexander. After emerging from the Black Forest the country ascends gradually for forty miles, and consists of a series of hills and dales. The geological formation of the hills is sandstone (not trap) and slate in alternate strata, here and there intermixed with a stratum of milk-white quartz. Indeed immediately after leaving Melbourne, and all the way to the Diggings, you continually meet with fragments of white quartz whichever way you turn. The country is generally wooded with the various species of Eucalyptus: they are ungraceful trees, but often grow to a height of eighty or a hundred feet. The yellow wattle, a species of Acacia, is a beautiful tree, covered with a profusion of golden blossoms smelling most fragrantly. Wherever we went the flowering Epacris attended our footsteps, reminding us, by its heath-like appearance, of our distant home. A small bright yellow Narcissus was also common, opening its delicate petals to the vernal sun.

A few days after leaving Mount Macedon my companions and I had each paid our thirty shillings license, and had become veritable gold-diggers, making our *debût* on Moonlight Flat or Gully, Forest Creek, and Natural History at once became a secondary consideration; still I never omitted an opportunity of admiring the beauties of creation, and of adding to my collection of insects.

About the middle of October the weather became settled, and the sun intensely hot. Insects of course appeared plentifully, more especially Coleoptera of the longicorn genus Phoracantha: these, flying at sunset, had the most curious appearance, from the great length of their outstretched antennæ. A large moth, an undescribed species of Ommatophora, was very plentiful in October and November, but always in bad condition. A species of the genus Plusia was also very common, and whenever I walked through the dried-up herbage, in October or the beginning of November, numbers of drab-coloured Noctuæ would start up before me.

During the month of November I observed many beautiful species of Papilio, Polyommatus, and other Lepidoptera, but I had no means of taking them; and this, together with the want of pins and want of time for setting them, caused an almost total cessation of collecting; nevertheless I continued to observe. On the 11th of December I had the good fortune to witness one of the most extraordinary flights of butterflies that was perhaps ever seen; they were all of one species, Pieris Teutonia: from sunrise to sunset the atmosphere seemed literally filled with them; before you, behind you, right and left, they were passing by hundreds of thousands: they came from the south, and flew directly against a northerly wind. I caught a few in my hat, sufficient to ascertain the species. For two following days they continued to pass in the same direction, although in diminished numbers each day. The rate at which these butterflies were flying was about seven miles an hour, and the flight extended, as I was afterwards told, many miles both to the right and left of Forest Creek.

From December to March I saw many insects, of all classes, that were new to me, but having no pins (I had lost them in the Black Forest) I collected but few. Had it not been for this misfortune I might now have made a good collection of Micro-Lepidoptera. In March I deemed it prudent to return to Melbourne to lay in a stock of provisions for the winter.

I left Melbourne on my return on the 1st of April, in company with a shipmate who owned a horse and cart, and pitched my hut on Forest Creek on the 6th. On this journey I captured several specimens of a very richly marked insect, the Agarista Callisto: as we travelled along these beautiful creatures would start up from the cart-ruts or clods of damp earth. On camping each night we made a roaring fire of cow-dung, and boiled our water for tea; then sat by the fire, smoking our pipes before turning in under the cart, where the ground served us for a bed. Many insects sacrificed their lives in the fire, and I captured while approaching several mutilated specimens of a new beautiful and most remarkable Bombyx, which Mr. Newman has since named Teara denticulata. On this journey we observed also myriads of a small and unnamed lepidopterous insect, probably a Crambus, which, on our lighting a candle under the cart, swarmed into it in such numbers as actually to extinguish the light; and many a time have I found it absolutely necessary to clear away their dead bodies from the wick with a lucifer match, or it would have been quite impossible to keep the candle alight. Before we retired they would fly by scores into the scalding tea, and as they floated lifeless on the surface, with outspread wings, I have often thought what a model for setting they presented to the entomologist.

As the autumnal months, April and May, advanced, insects became less plentiful, but did not entirely forsake us. The Lepidoptera were of smaller size, and many Micros used to come into our canvas tent at night, probably to shelter from the cold. In May, June, July and August we had many frosts: the ice, however, invariably melted before the following noon. During this season I found many beetles in pools of water, and also Lepidoptera, many of them closely resembling in colour our dark brown autumnal insects.

In July I removed to Barker's Creek, which in a few weeks resounded with the unceasing croaking song of innumerable frogs. In August and early September the gully was beautifully brightened by the golden blossoms of the wattles, which were three weeks earlier in flower this year than in the preceding one.

With the first burst of vernal vegetation, in August and September, new insect forms appeared, so curious and so beautiful that I could not resist the temptation to collect, but all my pins were gone; what could I do? I hunted over the collection I had made, and when I found more than two of a species I stripped them off the pins, and used the pins a second time for the novelties. By this means I managed to secure many new species, although for the same reason I kept only a single specimen of each. Several lovely Micros were thus preserved; they were mostly found settled on low and insignificant plants.

In October the slopes of the ravines were a blaze of bloom. Woody and stick-like trees and shrubs of the genus Casuarina, which at no period of the year bore anything worthy the name of a leaf, were now a mass of the most dazzling inflorescence. From October to the third week in November is the best season both for plants and insects at this locality. In Specimen Gully, about a mile from my tent, I saw more species than in any other spot throughout the Mount Alexander Ranges, and here I captured some of my most lovely insects.

On the 12th of November I received a packet of pins from England, which gave me much delight, and I found them of great service during what little remained of the entomological season. I would gladly have given their weight in gold to have had them six weeks earlier, but the bloom soon after left the ravines, the trees and shrubs resumed their stick-like appearance, the herbage was dried up and scorched beneath a burning sun, and day after day the sky was without a cloud. Collecting insects became a labour not unattended with danger. In pursuing some bright insect over rocks and bushes, you ran great risk of setting your foot on some deadly snake, or perhaps on a bunch of snakes holding connubial conference. I trod on one most venomous species whilst vaulting over bushes in chase of the beautiful little Pollaclasis viridipulverulenta, one of the Anthroceridæ, so like our Procris Statices as always to remind me of that familiar species.

During the hot weather I observed a dipterous insect with habits so singular that I cannot refrain from relating them. The size was that of one of our largest female bluebottles, but the colour totally different, the Australian species being banded with the brightest golden yellow: often while searching among the scrub, in Launceston Gully, have I seen a pair of these flies "locked in love's embrace," basking in air in the burning rays of the sun. A moment would they seem to rest, poised motionless: they would then rock to and fro, describing the lower half of a circle and returning in the same track, both pairs of wings vibrating in unison and flashing in the sun. On my attempting to net them, off they would dart, still united, but would halt at a very short distance, then hang for a few moments again motionless, and again commence their pendulum-like vibration as before. Although no dipterist I made many attempts to secure this beautiful and unknown fly, and once succeeded in getting a pair into my net, but one of them escaped before I could secure it, and the other alas! was afterwards accidentally crushed and completely annihilated.

In December, corresponding to our June, vegetation appeared paralyzed: trees and shrubs continued to grow, but nowhere is seen that luxuriant vegetation which the fields, woods and hedges of England exhibit during the summer. Australia does not produce that vividly green and succulent vegetation which is so beautiful with us: the vegetation, too, is very monotonous and unvaried. I have wondered how so small a variety of plants can produce so great a variety of insects: the larvæ, even of the Lepidoptera, feed much in the stems of the grasses and in the bark and wood of trees; indeed the gum trees, the wattles and a few grasses seem to bear the entire onus of supporting insect life. I have observed, also, that insects are of less regular appearance than with us. Although at the close of 1853 and beginning of 1854 there were thousands of species, they were not nearly so numerous in individuals as twelve months previously, and many species would be excessively abundant one year that were rare or entirely wanting at a corresponding period of the next year. The influx of diggers, the felling of hundreds of thousands of trees, the frequent fires in the scrub and grass, the upturning of acres of bushy and grassy land, may in some measure account for this, for by these causes myriads of insects must be destroyed. As agriculture succeeds to gold-digging, and profitable crops take the place of worthless scrub and grasses, we shall perhaps lose many local species which are now abundant. I recollect that Mr. Dickson told me this was the case with heaths: many beautiful species, each confined to a very limited locality in its native country, at the Cape, are now found there no longer, the demand for sale, together with the extension of building and agriculture, and the species not being capable of successful propagation here in England, having caused their extermination. Every one of these had perhaps an insect depending on it for support, and with the heath has perished the insect. In all probability this will be the case in Australia, where the species are excessively local; and most earnestly do I exhort our entomological brethren to describe and figure all they can, while yet they have the opportunity of doing so.

I made many attempts at breeding Lepidoptera, but succeeded only with a few Bombycina and a few dozens of a very abundant Thecla, the larvæ of which I found full fed: most that I got turned sulky and would not eat, and so died. One larva, which I never succeeded in rearing, particularly attracted my attention: I found it feeding nearly all the year round, and appearing gregarious, for I sometimes found them twisted together in masses as large as my hand, but generally there would be perhaps a dozen in company: their colour was nearly black, tinged along the sides with a dusky dirty yellow: when disturbed they would jerk up the head and tail, ejecting a thick filthy yellowish fluid from the latter. But the great singularity of the creature was that each would turn its head towards some one of the four cardinal points: out of a dozen perhaps three would jerk up their heads, and hold them exactly facing the south, three others would point them to the north, three to the west, and three to the east, the four directions of pointing being at right angles; the tails after a while would resume the horizontal position, and seem to become entangled and intertwined with each other, the whole party forming a most remarkable figure. Whether this is for warmth, or for coolness, or for protection from ichneumons, or for love of one another, or because they cannot help it, I am unable to say; but it is a sight worth seeing. [Mr. Davis has described a similar larva, but has not noticed its pointing to the cardinal points, which may possibly be accidental;

the pointing at right angles is, however, described as invariable: it is the larva of a large short-horned sawfly, Perga bella.]

During the summer I frequently found a forbidding-looking carnivorous beetle, velvety black with white spots: it runs over the trunks of trees, and is especially fond of prying into the crevices of the bark, seizing and devouring every insect it can find: its voracity is boundless. Often on lifting up a piece of loose bark I have found it fastened on a poor longicorn thrice its own size, and eagerly engaged in devouring its inside while the poor creature was still living: common as was this sight it always reminded me of some poor antlered stag in the death-grip of a wolf or deer-hound. Vain are the struggles of the poor Cerambyx when once this creature has fixed its formidable jaws in its thorax or abdomen. I have often found on the ground, or in the pools, the splendid Lamprima reduced to a mere shell by this savage enemy, and dropped from high up the trunk of a giant Eucalyptus.

I spoke of the enormous flight of Pieris Teutonia which I witnessed in 1852. I looked in vain for a similar phenomenon at the same period of the following year; two or three specimens at a time were all that I saw. The number of butterflies, that is of species, seems small in proportion to other insects, and these by no means handsomer or more brightly coloured than European species. The Noctuina are inferior to our own; there was nothing so beautiful as our Thyatira batis and derasa, our Aplecta herbida and Miselia aprilina, but the Bombycina were more beautiful, and the Micro-Lepidoptera far surpassed ours both in size and brilliancy of colours. I captured many that were previously unknown to Science, particularly of the genus Œcophora.

The Coleoptera are for the most part new, and often very handsome species: besides those I brought home I found the beautifully marked elytra of others floating in the pools, the perfect insects never having been found alive. I think the short twilight, the rapid transition from day to night, renders it difficult to find many of the species, both of Coleoptera and Lepidoptera, alive. I was particularly struck with the extraordinary manner in which the feet of many of the larger weevils, Curculionidæ, are cushioned or padded: this is evidently designed to enable them to walk over the trunks and branches of the smooth-skinned Eucalypti. I shall never forget the exclamation of one of my assistants when I pointed out to him this curious structure: "I'll be hanged," says he, "if the beetle has not got pattens on."

Several times I tried sugaring for Lepidoptera, but never succeeded.

I could only persuade one small species of Tineina to patronize my labours. I tried to account for this in the fact that the smooth bark of the gum trees, patrolled incessantly by large ants, does not offer the same inviting footing as our rougher barked oaks and other timber trees. I have often tried beating, and succeeded poorly with Lepidoptera, better with Coleoptera,—the young wattles, Eucalypti, and other less leafy trees, affording poor shelter for Lepidoptera, but being much frequented by Coleoptera. Entomologists at home who hear of the capture of novelties abroad feel a longing to partake of the excitement, but, if I except the gratification of finding novelties, I may truly say that I have found more pleasure in one day's collecting at dear old Darenth than in all the collecting I ever had in Australia. The interminable sameness of ungraceful trees and scrubby bushes; the tiresome walking over barren rocks, or in dried-up water-courses, destitute both of flowers and grass; a temperature of 120° or 130° in the sun; clouds of dust; myriads of annoying Diptera; the glare of light reflected from white quartz; and the imminent peril of treading on poisonous snakes, are the inevitable concomitants of collecting in the summer. To this must be added the fatiguing life of a gold-digger and the listlessness caused by sleepless nights, the result of attacks from countless fleas. When I had boxed a few insects and returned to my tent I was so worn out that I had no heart to kill and set them, but laid down and smoked until it was time to turn under my opossum rug, and then came the fleas!

On the 21st of December we moved to Campbell's Creek, a distance of seven or eight miles; it was an old digging-ground, and therefore a poor spot for Entomology. However, I obtained many Buprestidæ and a few brilliant species of Œcophora, despite the bad locality. About twenty yards from my tent were some dozen young wattles, three feet high, and two or three bushes of Eucalyptus: they were on an arid flat, with little or no other vegetation within some hundred yards, yet here I took better insects than in any other locality, one of which, a Micro, the Boydia criniferella of Newman, I cannot help describing. One evening in January I saw in the dusk an insect quite new to me; it was sitting on the smooth bark of a gum tree, one pair of wings (the hind pair) having the costal margin ciliated in the most extraordinary manner; the fore wings were in motion, vibrating and beating the air in a very curious way. After continuing this motion for several seconds the insect would start off, and run with great speed, but stop at the distance of a few inches, and then vibrate its fore wings as before. When at rest the costal margin of the hind wings projected beyond the costal margin of the fore wings, as in Gastropacha Quercifolia, and the wonderful fringe of cilia could be seen to great advantage. I saw about half a dozen specimens of this novelty on the same evening, but never saw it before nor since, as many ants were prowling up and down the tree, seeking what they might devour; and it occurred to me that this motion might be employed perhaps in connexion with the wonderful cilia, as a means of obtaining information of one of these deadly enemies: the fringe, however beautiful in structure and extraordinary in length and situation, has doubtless its peculiar object in the economy of the creature.

And now that I have ants in my mind I must have my say about them also. They are the most common insects in Australia, being absolutely everywhere. I have seen in Australia the largest and the smallest ants that I have ever met with: the largest are fully an inch in length, and furnished with the most formidable mandible; their bite is severe and most painful. I was told before I left England to search the ants' nests of Australia for Clavigers and other myrmecophilous beetles: I tried the experiment once, but was compelled to retire before the thousands of active and courageous insects rendered furious by an invasion of their home. "Ah!" thought I to myself, "if Sam Stevens wants Australian Clavigers he had better come here and hunt for them himself." If you stop even for a minute to look over the bark of a tree, ten to one but the ants run up your boots and trowsers in the most aggravating manner, for their homes are almost invariably at the foot of trees. They are excessively pugnacious, and jealous of an intruder on their territories. I have often seen one quietly descending a tree, when, on coming nearer than he approved, he would stand out horizontally from the trunk, clinging by his hind legs only, and in this position would snap at me with his huge mandibles, and spar at me with his fore legs just like a pugilist. They are real plucky creatures, and seem to have sense and discrimination, for although they walked about my tent by hundreds, and ran over my face day and night, they never molested me while there. Sugar is the great attraction to them. I kept mine in a tin box, and, despite my care in keeping it covered, they would sometimes get at it and have a rare feast, but on my entering the tent they would scamper off in all directions, as though self-convicted plunderers. I said then, and believe it now, that these ants knew me, and knew that the tent belonged to me. If bees know their master, why should not ants know a particular individual? They knew they were not at home; they knew they stole my sugar and that I did not molest them, and, except as regards petty larceny, they never molested me.

In December that beautiful hairstreak, Thecla Evagoras, comes out everywhere: it is of a most lovely metallic-blue colour, and has a graceful but rather feeble flight. The caterpillar is gregarious. I have often gathered a twig of wattle with forty or fifty of the pupæ attached to it, and unchanged larvæ still feeding amongst them; but I allude to this butterfly solely with the view of mentioning, in connexion with it, a peculiarity of the ant tribe. The first batch of Evagoras pupæ that I found was on a little conical sprig of wattle; at the base of the pyramid were a number of the reddish black pupæ glistening in the sun; above these were others, still undergoing their metamorphosis; and at the apex were larvæ still feeding. Hundreds of black ants were bustling about in this colony of butterflies, and I supposed at first their object was to devour the soft and newly-changed pupæ, but this was not so. I found that the skins of the larvæ, immediately after the change, remained tightly adhering to the tail of the pupæ, and that the pupæ had no power to get rid of them. The ants ate this skin only, stripping it off, devouring every particle of it, and leaving the polished chrysalis glittering in the rays of the sun. These ants appeared to delight in running over the backs of the still feeding caterpillars, but never did them the slightest injury. I picked many of the twigs covered with these colonies, and, bringing them into my tent, found the ants most unwilling to leave their companions: however, they did not like the absence of sun, and one by one took their departure. The larvæ continued to change, the skins still adhering to the pupæ. In a few days the butterflies began to appear; those from the pupæ cleansed by the ants were bright and beautiful, the others with crippled wings and unable to fly: this might have been occasioned by the diminished light within the tent, but I could not help attributing it to the want of the kind attentions of the ants.

If any insects in Australia can dispute numerical supremacy with the ants it is certainly the flies, the various species of Muscina; one in particular, somewhat smaller than our bluebottle, is a dreadful pest. It breeds in the offal which abounds at the Diggings, and is perpetually buzzing about you, especially when eating: it settles on your face, and even in your eyes, and you have a hard task to protect your meat, cooked or uncooked; it will settle on it the moment it has cooled, and deposit its masses of eggs, which almost immediately become maggots: some even say it deposits living maggots, but this I assert from observation. In December and January they give way to a smaller species that is still more troublesome: they come in clouds and follow you incessantly, not to bite, but to suck moisture from your lips, your eyes, or wherever it is to be obtained. Many of the diggers wore veils, others bound little twigs of Eucalyptus before their eyes; but the best remedy is to smoke perpetually during the sunshine: they appear to have a deep-rooted aversion to the weed. I can scarcely distinguish this species from the common house fly (*Musca domestica*) of England. These last till March, when another fly assails you, called the March fly, a species of Tabanus, a dull sleepy-looking insect, that bites severely, instantly drawing blood from man or beast; but these are not so numerous and therefore not so formidable as the smaller pests. Before I conclude these remarks on flies I must add that sore eyes and ophthalmia are common complaints in Victoria. I have observed hundreds of people with one or both eyes so swelled that they could not see. The dropsical-looking eyelids are puffed up on a level with the cheek and forehead: this is called having the blight; it is usually attributed to flies, but with what truth I am unable to say. I observed that men with large or humid eyes were most liable to this distressing complaint.

Among the Lepidoptera of Victoria a green Geometra, closely allied to an English one, was of common occurrence. Many Noctuæ that I should have thought nocturnal flew in the hottest sunshine, and the beautiful species of the genus Synemon, now arranged as one of the Heterocera, flew about all day as merrily as any of the butterflies, and rested at night with erected wings. The new and unique Teara Guenéi of Newman, one of the most lovely and remarkable of its tribe, I caught on a hot day in November, about 2 o'clock in the afternoon, after a most severe chase.

I had not long been in the country before I observed, lying about at the foot of a gum tree, several little oval objects, which I at first supposed to be eggs fallen from nests among the branches above, but on touching them I found they were attached to some substance, as the bark of the tree, or to a twig or a blade of grass. On examining them I found a case or cap had invariably been pushed off one end, and I then concluded they were the cocoons of a Dipteron. At last I found one entire, and, having opened it, I discovered they were lepidopterous. Incited by this discovery, I searched diligently for more, and succeeded in obtaining several. I took them with me down to Melbourne, where a beautiful female made its appearance, and to this Mr. Newman has since given the name of Pelora Oxleyi. It is wonderful how so large a moth could be contained in so small a cocoon. Another Bombyx, Entomela obliqua, is a sackträger; I have often found the larvæ carrying a most beautiful case, composed of the twigs of Eucalyptus, but have been unsuccessful in all my attempts to breed a perfect imago.

As I am now bringing my memoranda to a close, I will just state that on my return I placed my collection in the hands of Mr. Newman, who felt so much interested that he selected and described thirty novel or unique Lepidoptera in his usual lucid and erudite style. The paper is published in the 'Transactions of the Entomological Society of London,' and is accompanied by figures, beautifully coloured, by my esteemed friend Joseph Standish. The first species described by Mr. Newman, Zeuzera Duponchellii, I found in January, 1854, at rest on one of the wooden legs of my windlass; I borrowed a large pin, and at night managed to convey him to my tent. Cheimabacche Cinderella I took at Barker's Creek, in November. Of Tortricopsis Rosabella I saw four or five: this insect is particularly interesting as belonging to a group, not uncommon in Australia, which seems exactly intermediate between the Tortricidæ and Tineidæ. Many of the insects described in Mr. Newman's paper were unique or extremely rare, but I could not avoid a feeling of great disappointment when that gentleman returned the collection to me with all the Geometræ, which were the gems and my especial favourites, unnoticed and unnamed. On my asking Mr. Newman why he had left the best and most beautiful insects unnamed, he immediately replied, "M. Guenée is now engaged in describing the Geometridæ of the whole world, and I will leave to him the undivided honour of naming these lovely insects."

In February, 1854, that success which had previously eluded me in the gold field began to set in, and Entomology again fell into abeyance; still I never left the tent without my pill-boxes, and rarely returned without some addition to my collection. After a while fortune again forsook me, and my assistants became incorrigibly drunken; so, having secured a few pounds of the hard yellow earth, I turned my face homeward. I sailed from Melbourne on the 24th of July, 1854. My last entomological doing was the finding of several cocoons of Pelora Oxleyi at Brunswick, near Melbourne. Several Saturnias which I had in cocoon emerged when we were off

Pernambuco, and one specimen of Entometa in England, in July, 1855.

T. J. R. Oxley.

Bayswater, near London,
October 28, 1857.

Proceedings of Societies.

Zoological Society.

Tuesday, November 10, 1857.—Dr. Gray, V.P., in the chair.

Mr. Gould exhibited and described several new species of birds from various parts of the world. He commenced by calling attention to three species of Australian birds, collected by Mr. Elsey during the recent expedition under A. C. Gregory, Esq., from the Victoria River, on the north-west coast, to Moreton Bay. Two of these birds were of especial beauty and interest, viz., a Psephotus and a Malurus. The former is allied both to P. pulcherrimus and P. multicolor, but differs from either, among other characters, by the rich yellow mark on the shoulder; and the Malurus is distinguished from all other members of its genus by its larger size, and by the beautiful lilac circlet which adorns its crown. The third bird alluded to is a species of Petroica allied to P. superciliosa, a bird discovered by the late Mr. Gilbert in the neighbourhood of the Beiderkin Lakes, and which, with the present, would admit of separation from the other species of the genus. For these birds Mr. Gould proposed the following names:—

Psephotus chrysopterygius
Malurus coronatus
Petroica cerviniventer

The next species to which he directed attention was a new hawk belonging to the genus Spilornis, and which differs remarkably from S. undulatus, or Bacha, of the Continent of India, and S. holospilus of Manilla. For this bird Mr. Gould proposed the appellation of Spilornis rufipectus. It was obtained in Macassar by Mr. Wallace.

A new bullfinch of typical form was described under the name of Pyrrhula aurantia. For his knowledge of this pretty species Mr. Gould was indebted to the researches of Dr. A. L. Adams, of the 22nd Regiment, who killed it in the Western Himalayas.

For a new motmot Mr. Gould proposed the name of Momotus æquatorialis. This is a large and robust species, and differs from all others in the broad spatulate feathers of the breast tuft. It was obtained at Ardudona, near the equatorial line, in the Andes.

A very fine Odontophorus, remarkable for the rich chestnut-red colouring of its under surface, received the appellation of Odontophorus hyperythrus. For this bird Mr. Gould is indebted to the Messrs. Verreaux, of Paris, who obtained it in a collection from Santa Fé de Bogotà.

Mr. Sclater read a note on an unnamed parrot now living in the Society's Gardens, and on some other species of the same family. M. Auguste Sallé having called his attention to the fact that the whitefronted parrot of San Domingo, commonly regarded as the immature state of Chrysotis leucocephala, is in truth quite a different species from that bird. It may be distinguished at once by having no red on the throat, and a narrower white frontal band than the true leucocephala, which is from Cuba. M. Sallé, who has had ample opportunities of observing this bird in its natural state, is quite confident as to its distinctness. Mr. Sclater proposed to call the San Domingo bird, which has not yet received a specific designation, Chrysotis Sallæi, as a just tribute to one who has made such extensive discoveries in the Natural History of the New World.

Mr. Sclater also read a paper on a collection of birds received by M. Sallé from Southern Mexico, in which he described a new species of Diplopterus, under the name of D. excellens. The author's attention was called to this bird by M. Jules Verreaux, whose experienced eye is ever active in distinguishing new species.

At the conclusion of his paper Mr. Sclater observed that M. Sallé had, at his request, drawn up a list of birds met with by him in San Domingo, together with some interesting observations on their habits. He had taken some pains in the verification of the nomenclature of M. Sallé's list, and added a few observations on the range of the species

The Secretary read a paper by Sir John Richardson, M.D., F.R.S., on a new species of Siphonognathus, which he characterized under the name of S. argyrophanes.

The Secretary exhibited to the Meeting drawings of the Honduras turkeys, and a pair of very young Pumas now living in the menagerie.

Tuesday, November 24.—JOHN GOULD, Esq., V.P., in the chair.

The Chairman called the attention of the Meeting to four new species of rodents from Australia, which he described under the names of Mus assimilis, M. nanus, M. sordidus and M. manicatus. To these interesting species of the mammals of that country a fifth was contributed by Dr. Gray, from the collection made during the expedition under A. C. Gregory, Esq., which he has named Hapalotis hemileucurus.

The Chairman exhibited an unique Australian bat (*Molossus australis*) from the museum of the United Service Institution, to which it had been presented, in 1832, by Major M'Arthur.

The Secretary read a paper by Dr. Gray on the genus Furcella of Oken. On making an aperture in a perfect specimen of Furcella which recently reached his hands, Dr. Gray found that although the animal had two of the characteristics of the family Teredinidæ it wanted the third (the plates within were only the pallets, which are simple and somewhat like those of the more common Teredo norvegica); that there were no proper shelly valves, nor even any rudiments of them; and that the animal forms a genus in that family which has the abnormal character of wanting the true shelly valves which are so universal in the Conchifera. The reason of this absence seems to be explained by the fact that the animal does not require them to protect its head and nervous centre, living as it does in a soft sandy mud; while they are required in Teredo and the allied genera, which have to bore their way into hard wood or stone to form the hole that is to be lined with the shelly tube. Sir Edward Home, in his 'Lectures,' when describing the animal of Teredo navalis, refers this shelly tube to the genus Teredo, and gives a very good figure of the pallets, or, as he called them, "operculum;" but he was not aware of the absence of the shelly valve, for he figures what he considers the "boring shell of the same Teredo:" what he has here taken for the "boring shell," or true valves of the animal, is evidently a fragment of the plate which closes the end of the tube.

Mr. Sclater communicated a review of the South American family Momotidæ, containing descriptions of all the known species of these birds, with an account of their synonymy and geographical distribution. In this paper the previously undedescribed species were characterized as M. microstephanus and M. Nattereri, the former from New Grenada, the latter from Bolivia; and it was proposed to employ the term Prionirhynchus instead of Crypticus (previously used for a genus of Coleoptera), and to elevate the peculiar Prionites superciliaris to generic rank under the title of Eumomota.

Mr. Sclater also read an account of a small but interesting collection of birds lately transmitted by Mr. H. W. Bates from the Upper Amazon. Amongst the more noticeable species herein contained were a new Capito, proposed to be called C. aurantiicollis; and a specimen of Chiroxiphia regina, a new manakin, allied to C. pareola, which was until then only known from Natterer's specimen in the Imperial Cabinet at Vienna.

With reference to Mr. Gould's Australian mammals, Mr. Sclater remarked that the fact of Chiroptera and Rodentia being the only orders besides marsupials met with in Australia was an additional argument in favour of the low position in the series of Mammalia lately assigned to the two classes by Professor Owen.

Mr. F. Moore read a paper on the Asiatic species of Neptis and Athyma, in which he described eight new species of the former and eleven of the latter.

The Secretary read a letter addressed to Mr. Gould, from Mr. Cumberbatch, respecting the weight of the common partridge in those districts of the New Forest in which they appear to feed exclusively on bog plants, and have no access to corn-land. Three of these birds weighed respectively 13 oz., 12¼ oz. and 11¼ oz.—*D. W. M.*

NORTHERN ENTOMOLOGICAL SOCIETY.

September 11, 1857.—B. COOKE, President, in the chair.

Election of Members.

B. B. Labry, Esq., of Manchester; John H. M'Keand, Esq., and Robert H. M'Keand, Esq., of Lawton; and G. A. Almond, of Birkenhead, were elected Members of the Society. Edwin Shepherd, Esq., of London, was elected an Honorary Member.

Exhibitions.

Mr. Allis, of York, exhibited a large box of varieties of Lepidoptera; amongst them were extraordinary varieties of the following species:—Vanessa polychloros and V. Urticæ, Argynnis Adippe and A. Aglaia, an hermaphrodite A. Paphia, an Apatura Iris without the usual white markings, an Arctia caja with red markings upon the superior wings, Phragmatobia Menthrasti (*var.* Walkeri), P. lubricepeda (*var.* radiata, *Haw.*), and a singularly light variety of Ceratopacha ridens.

Mr. Allis also exhibited a box in which were Hydræcia palustris, Valeria oleagina, Agrotis fennica, &c.; also a box in which were a series of the autumn brood of Harpalyce silacearia, eight Nonagria concolor, eight Sciaphila bellana, twelve Laverna phragmatellus, *Bent.* (which he distributed amongst the members), a fine specimen of Acidalia rubricaria captured near York, Gelechia inornatella, Melosoma bipunctellus, Lithocolletis irradiella, Œcophora formosella, Coleophora chalcogrammella, and C. Frieshella.

Mr. Buxton exhibited a box of Lepidoptera, the most interesting species in which was a fine specimen of Heliothis armigera; he also distributed a number of Harpalyce picaria amongst the members.

Mr. Hague exhibited six hybrids between Smerinthus Populi and S. ocellatus, which he had bred from eggs obtained by Mr. A. Lomax, who has devoted much time to breeding hybrids.

Mr. Carter exhibited a box of exotic Coleoptera, from his collection, containing twenty-eight species of Longicorns, unnamed; they had recently been returned from Mons. Chevrolat, of Paris, as new species. Two of them were from Australia, one from Texas, three from Venezuela, two from Silhet, two from Brazil, five from North America, one from the East Indies, and of the remainder country unknown.

Mr. Linton exhibited a box of Hymenoptera containing many interesting species.

Mr. Greening exhibited a large box containing specimens in several orders, principally Hymenoptera, Diptera and Hemiptera. The most noticeable species in this box were,—in Hymenoptera, Cimbex femorata and Hylotoma ustulata; in Diptera, Chironomus rufipes, Erioptera maculata and nodulosa, Limnobia lineola, nigrina, punctata, vagans, tripunctata, nubeculosa, dumetorum, glabrata, immaculata, and a pretty species allied to trimaculata, Tipula lutescens, gigantea, longicornis, lateralis, vernalis, lunata, &c., and a number of interesting Trichoptera. The contents of this box were much admired for the beauty of the specimens and the setting of the Tipulas, and an interesting discussion ensued on the best way of capturing and setting them.

Several members remarked on the unusual abundance of Locusta migratoria (one of which, taken at Warrington, was in Mr. Greening's box), observing that it had appeared throughout Great Britain and Ireland this season.

The President exhibited the following insects, captured by himself this season:—Myrmedonia canaliculata, Antherophagus pallens, Ips quadripunctata, Macrocera vittata, phalerata, fasciata, Chironomus virescens, Tipula lutescens, longicornis, scurra, Asilus albiceps, Thereva bipunctata, Platypeza infumata, Sciomyza corregiolata, Osmylus chrysops, &c.

The Secretary exhibited two specimens of Acontia luctuosa on behalf of Mr. Battersby, who had met with this species freely near Torquay; also a box kindly furnished by Mr. Brown, of Cambridge, containing Tortrix dumetana, Pionea margaritalis, and Polyommatus Arion, recently captured by himself; and a box containing Mixodia Turionana, Laverna phragmatellus, and Nonagria concolor, which had been presented to him by Mr. Doubleday.

Mr. Gregson exhibited the larvæ of twelve species of the genus Eupithecia upon their food-plants, observing that nothing was easier to find in the larva state than this hitherto much-neglected genus, and that now was the time to go beating for the tree, hedge and shrub feeders, sweeping for the heath feeders, and hunting for those which feed upon low plants, or upon plants which grow where beating and sweeping are impracticable, and for the seed feeders, some of which could not well be beaten out or swept for advantageously. The principal species exhibited were Eupithecia satyrata, upon flowers of Scabiosa succisa, discovered by Messrs. Logan and Wilson, and sent by Mr. Wilson; E. linaria, upon flowers and seed of the common toadflax; E. minutaria, flowers of Calluna vulgaris; E. sobrinata, junipers; E. castigaria, seed of Lychnis diurna; E. castigaria from Mr. Wilson; E. centureata, upon flowers and seed of Senecio Jacobæa; E. irriguata, sloe-leaves; E. succentureata, found upon wild plum where Linum was growing in the same bush, but never observed to eat either, also found freely upon Achillæa Millefolium (principally sent by Mr. Wilson); E. Absinthiata, taken freely on flowers and seed of Senecio Jacobæa; E. assimilata, under black currant leaves.

Mr. Gregson also exhibited a box containing seven varieties of Abraxas ulmaria, collected over a series of years, observing that Mr. Dale had kindly sent down a continental specimen of Abraxas pantaria, *Linn.*, for comparison, and he had little doubt of its being only a variety of ulmaria, for two of his recent light varieties were counterparts of what the foreign one had been when it was first captured (age had taken from its beauty); the under side also agreed exactly.

He also exhibited a box of Coleoptera recently captured; amongst them were Anchomenus marginatus and sexpunctatus, Bembidium bipunctatum and pallidipenne, &c.

Acentropus niveus a Lepidopterous Insect.

The following paper, contributed by Edwin Brown, Esq., of Burton-on-Trent, was read by Mr. B. B. Labry, the author being unavoidably absent:—

"I am glad, as a sort of inaugural thesis, to communicate to the Society the fact of my having *proved* Acentropus niveus to be a lepidopterous insect. I had spent many hours at various times in search, by means of my boat, after the earlier states of this insect, and had carried home many curious larvæ captured amongst the water-weeds, in the hope that some one or other would prove to be the right one, but without effect, until I one day found, in the axils of the thread-like leaves of Potamogeton pectinatus, several small silken cocoons, strengthened by the incorporation of small pieces of leaves, arranged lengthwise, from the same plant. On reaching home I placed them in a deep dish of water, in which were some stones projecting above the water, and, having placed the dish in my garden, so as to secure the full light of the sun upon it, I covered the whole with a bell-glass. On the following day I had the great gratification of observing a perfect male Acentropus niveus resting upon one of the stones: I searched for and found the empty chrysalis, and in the evening sent it off to Mr. Haliday, in proof of the lepidopterous nature of the insect. Depending upon obtaining a further supply of larvæ on my next visit to the river, I opened the remaining cocoons, and found therein one similar pupa undeveloped, and two or three small greenish larvæ, which I presume to be those of Acentropus niveus. Unfortunately the heavy rains of last month set in immediately afterwards, and the floods prevented me going on the river again until all trace of the early stages of the insect was lost. The pupa-case puts the relationship of the Acentropus beyond a doubt: it is clearly the chrysalis of a moth, and I presume the proper location of the species in our list will be immediately after the genus Hydrocampa."

Mr. Brown added that he had before him three examples of Locusta migratoria recently captured in his neighbourhood, and that another example was seen but not caught. One female had deposited some eggs.

An interesting conversation ensued, all the members evincing great pleasure that this long-disputed question was brought to a close, especially as it had terminated in accordance with the opinions of the northern entomologists, and had been determined by one of them.

The Secretary observed that Westwood had certainly placed it as a lepidopterous insect many years ago, but in the comparatively recent work, Westwood and Humphrey's 'British Moths,' 1845, he had placed it (provisionally it is true) as the very last moth before the plumes, observing that "it should probably be placed nearer to some of the Hyponomeutidæ," and giving the presence of a pair of tippets, and a spur at the base of the fore margin of the hind wings, as two characters it possessed which are distinctive of the Lepidoptera. His generic and specific descriptions of this moth, however, are such as to lead to the conclusion that Mr. Westwood had not an opportunity of thorougly examining the Acentropus, the insect being nearly related to the Pyralidæ, and having no relationship with the Hyponomeutidæ whatever.

The special thanks of the Meeting was voted to Mr. Brown for his interesting and instructive paper, and, the thanks of the Meeting being voted to the exhibitors for their kindness, the members and friends separated, after having had a regular "red letter" Meeting.—*C. S. G.*

Anecdote of a Dog.—Yesterday a dog was brought up from Edinburgh in a steamer to St. Katharine's Docks. It was brought to a gentleman's office by a man, and remained there all day. The gentleman walked home with it to Barnsbury, leading it by a chain, and it was chained up in the coach-house. During the night it slipped its collar and got away. When the gentleman went to his office this morning he found that the dog had been brought there again: it had found its way back to the very ship in which it had been brought to London, having walked all the way from Barnsbury to St. Katharine's Docks.—*Robert B. Were; London, November* 17, 1857.

Occurrence of the Great Spotted Woodpecker (Picus major) *at Dulwich.*—On the 6th of the present month a female specimen of this bird was found dead on a hedgebank in this neighbourhood. To all appearance it had been killed either by a stoat or weasel. I have observed it in this locality before, but it is evidently scarce with us here. The smaller species, Picus minor, is more common.—*C. Wood; Dulwich, November* 13, 1857.

Nesting of Swallows and other Birds.—In a late number of the 'Zoologist' (p. 5790) reference is made to the fact of swallows attaching their nests to the side of a wall without being supported by a projecting ledge, as is usually the case. A year or two ago a pair of swallows built their nest in a coal-cellar here in the manner described. The nest was quite open at the top, as swallows' nests usually are, and was attached on one side, to the wall only; it was placed at the distance of a few inches only from the roof. The brood was reared in safety. It would certainly seem wonderful how the nest could bear them; but young birds, especially swallows and martins, cannot be very heavy; and the clay, which they both use alike in the construction of their nests, is very tenacious. The writer has also some remarks on the wren being a late breeder. I have found its eggs in the last week in July, which is, I think, even later than he mentions; eggs of the greenfinch are, however, often to be found in August, and both this year and last I saw young greenfinches which had not left the nest by the end of the first week in September. The barn owl must also, in some cases, be a very late breeder, as this autumn I saw a young bird, taken from the nest early in September, which was still covered with down, and could not fly in the middle of that month.—*E. J. Tuck; Wallington, Herts, October* 22, 1857.

Notes on the Swallow.—The last swallows which I have had the pleasure of seeing here appeared on the 4th of this month, and were watched most wistfully until they were out of sight. They have delighted, I dare say, as much as we have in the glorious summer which has lately left us. Their increase has been unusually great: two pairs (chimney swallows) came to my outbuildings in the spring, but they had increased to sixteen before they left. I never see a new house rise hereabout which has not its own swallows during the first or second summer. The rising ground on which this house stands, about a mile from the Thames, is one of their favourite trysting-places in the autumn, and here they gather from the neighbouring country round before they go to roost. The muster this autumn was one of the most interesting ornithological conclaves it has ever been my good fortune to witness. On one evening especially they came in countless numbers, and I think even surpassed the multitudes which assemble at some of the breeding-places of the sea birds on the coast. The sky was brilliantly blue, and as far as the eye could see they covered the firmament as the stars cover the heavens on a winter night, and as far as the telescope could reach its disk was covered with them. Their cheerful chattering was most delightful to listen to: it was one unceasing hymn of praise. They had come in groups, and chiefly from one direction; but their departure was in a moment: I had turned round to speak to Mr. Hancock and his sisters, who were delighted spectators of the wonderful scene, and, to the astonishment of us all, they were gone; in a minute there was not a single swallow left. The concourse was chiefly of chimney swallows; there were few house martins, and a good many sand martins. House martins are scarce here, and I sadly miss them. There is no better climate in England, and the only way in which I can account for their absence is by supposing that they have difficulty on our gravelly soil in procuring clay with which to build their nests. I am told that the swallows sleep on the willow-beds on the river, and one evening, whilst I was in the low ground between this and the Thames, a cloud of them passed over very near my head in rapid flight.—*W. C. Hewitson; Oatlands, November* 15, 1857.

Occurrence of the Avocet (Recurvirostra avocetta) *in Kent.*—I have just preserved a fine specimen of this bird for Mr. Gateridge, of Faversham, Kent, shot close to the town. A few years since it was to be found in numbers in this neighbourhood.—*James Gardner; 52, High Holborn.*

Concerning a venomous Lizard in Gujerat.—Can any of the readers of the 'Zoologist' who are learned in the Reptilia give me information concerning a venomous lizard said to inhabit the district of Gujerat, in Hindostan? Is there indeed upon record any well-authenticated instance of the existence of any such reptile anywhere? Yet such I am assured is the case in the instance to which I refer, and I have it vouched for upon such unquestionable authority as appearsto me to leave no room for doubt upon the subject. My informant, an Indian officer of many years' experience and of unimpeachable veracity, says there exists a lizard known to the natives by the name of the "Chând 'n ghûr" (the spelling is my own), the bite of which is of so deadly a nature that death invariably follows in the space of two or three hours. My informant states that three instances came under his own observation in which death ensued from the bite of one of these reptiles; and at length he had an opportunity of bringing to the test of anatomical dissection whatever doubt he might still have entertained upon the matter. Within his own "compound," and near to an old ruined wall, he saw a "Chând 'n ghûr," which he transfixed with his spear, and said to the doctor of the regiment, who was present and had repeatedly denied the existence of venomous lizards, "Now, doctor, I'll make you a bet that this lizard has poison-fangs." "Done," replied the doctor; "I'll lay you a gold mohur he has none." The doctor accordingly took home the defunct lizard, and upon dissecting the head found the entire apparatus of fangs and poison-glands fully developed, in the same manner as in the viperine tribe. The lizard is described as being from 18 inches to 2 feet in length, very agile, of a brown colour with ochreous-yellow spots, and is said to delight especially in old ruinous walls, in the neighbourhood of which it is always found.—*W. V. Guise; Walsingham Abbey, November* 3, 1857.

Spider Silk.—Seeing a notice (Zool. 5835) concerning the silk obtained from a species of spider, a native of Austria, I beg to say that in the Bermudas, some three years ago, I obtained silk from the large spider of those islands, Epeira clavipes, which was so strong that I could wind the single thread, from the insect itself, on a piece of paper, just as I would wind cotton upon a reel. This is the species of spider that forms its web between cedar trees, often ten feet apart; and in this formidable net, composed of the silk I have mentioned, are captured a large and powerful species of Cicada (*Fidicina Tibicen*), and sometimes even the little bird locally named "chick of the village" (*Vireo noveboracensis*). I may also add that the Mudian ladies use this silk for sewing purposes. I had this latter fact from an old lady who had been resident in the Bermudas all her life.—*J. M. Jones; November* 12, 1857.

Lepidoptera at Plymouth.—Colias Edusa: about a hundred specimens have been taken here during the season. C. Hyale: three specimens. Sphinx Convolvuli: I have had two specimens brought to me. Acherontia Atropos: one larva was brought to me, but a brother collector obtained upwards of fifty. Heliophobus hispidus: I have been exceedingly fortunate with this species, having had a large catch.—*J. J. Reading; Plymouth, November* 21, 1857.

Colias Edusa in Scotland.—As there is only one recorded capture of this insect in Scotland (Zool. 1985), it may be interesting to know that this season eighteen specimens have been taken in the neighbourhood of Dumfries. Being at Southerness, a small sea-bathing place on the Kircudbrightshire coast, I took two males, one on the 24th and the other on the 31st of August; but on the 12th of September I was so extremely fortunate as to capture a couple of females (one of them so exceedingly fine that it must, I think, have emerged from its chrysalis the same day), which are, I believe, the first ever taken in Scotland. The same day I caught two more males, and another collector also obtained a pair. About ten individuals were also captured near Dumfries at different times, making, with the eight mentioned above, a total of eighteen, sixteen of which were males, the only females being the two obtained by myself: such a disparity in the numbers of the sexes is very remarkable. I may add that on the 14th of September I saw what appeared to be C. Hyale, though it may only have been Helice, but I am pretty confident it was Hyale. I had a good view of the insect, as it led me a long and exciting chase, which I was at length forced to give up from want of breath. I am aware that entomologists do not attach much value to the mere "seeing" of insects; however, I only wish what I have written to be taken for what it is worth.—*Wm. Stewart Thornburn; Southerness, by Dumfries.*

Curious Variety of Apatura Iris.—On the 13th of July I had the good fortune to capture, in Ashton Wold, near this place, a very singular and interesting variety of Apatura Iris, a notice of which may perhaps prove interesting to some of your readers. In this example there is an entire absence of the beautiful white band which, in the ordinary specimens, crossing the middle of the hind wing, extends into the middle of the fore wing. Of the five white spots extending in a curve from the costa to the anal angle one spot only, *viz.* the fourth, is visible; the two spots near the tip are smaller than usual, the second of the two being little more than a speck; the costa and tip strongly powdered with fulvous; and the usual fulvous ring of the posterior wing, being broken on the lower side, extends in a strong fulvous marking over the anal angle. The rich purple shade is spread over the wings as in the ordinary insect, blended, however, in parts with fulvous. The under side is equally remarkable, though difficult to describe, the colouring and markings being much confused. Different as this is from the ordinary specimens, yet to an experienced eye it is obviously no other than a variety of Apatura Iris.—*William Bree; Polebrook, Oundle, Northamptonshire, December* 5, 1857.

Remark on Melitæa Dia.—I see by the 'Intelligencer' (iii. 60) that there is a record of the capture of a third specimen of Melitæa Dia. The other two specimens I had the good fortune to capture, in Warwickshire, years ago.—*Richard Weaver; 25, Pershore Street, Birmingham, November* 13, 1857.

Remarkable Variety of Argynnis Euphrosyne.—Mr. Weaver has placed in my hands a specimen of Argynnis Euphrosyne so remarkable that I think the readers of the 'Zoologist' will take some interest in a description of it. The specimen is rather above the average size, and the spathulate terminal portion of the antennæ is of nearly double the usual length; the apex itself is very much flattened and twisted backwards. The upper surface is nearly black, the usual tawny spaces being almost obliterated by the suffusion and union of the black markings; this is more particularly the case with the hind wings, in which the only remaining traces of tawny are confined to the anal angle, and six obscure spots just within the outer margin. On the under side the colours of the fore wings are more suffused than usual, but otherwise not remarkable, but the distribution of colour in the hind wings is totally changed; the prevailing colour towards the base is greenish yellow; the marginal silver spots are changed into large silver markings of an elongate-conical form, and the middle one of the seven unites with the large silver spot in the centre of the wing.—*Edward Newman.*

Is not Satyrus Typhon a Species?—I observe in Mr. Stainton's useful 'Manual of British Butterflies and Moths' there is no mention made of Satyrus Typhon, but only of S. Davus. In my opinion there are two species included under this name, and I send you for examination a pair of what I believe to be the second species: it is smaller, and without the spot on either side. I am well aware that S. Davus is very variable, but there must be some limit to variation. It is said that the larva of Davus is unknown, but I have often had the larva and bred the butterfly, and so have many others; and I have always taken what I call Davus on low moors or mosses, like Chat Moss; but what I take on the high mountains of Scotland appears to me to be distinct, and few men have had the opportunity of examining it in its native habitat as I have done.—*Richard Weaver; November* 13, 1857. [The mountain specimens sent me by Mr. Weaver are exactly as he describes them, without spots; but I do not wish to express any fresh opinion as to its specific difference.—*E. N.*]

Plentiful Occurrence of Trochilium vespiforme in England.—In the summer of 1855 a farm servant caught, amongst a host of other insects, two of the above-named, but in very sad condition. The following summer none were obtained, but in 1857 enough were caught to make a goodly series in my own private cabinet. I have every reason to believe that this is another Trochilium taken only in this country, and hardly known to the continental collectors. For several reasons I must decline giving the locality for some time to come.—*James Gardner; 52, High Holborn.*

Habits and Locality of Anthrocera Minos.—Although not yet able to trace this insect through all its stages, owing to want of success in rearing the larva, it may be interesting to many entomologists to know that in the pupa state its habits are very different from those of our other species of Anthrocera. The cocoon is not pointed at the ends, but oval, of an earthy colour, and, in the instances in which I succeeded in finding it, attached to a stone at the surface of the ground. From the profusion in which the perfect insect exists in a very restricted locality, and the fact that only two cocoons rewarded a very careful search, I am inclined to think it is ordinarily placed among the roots of the grass, but the locality is one in which the most adventurous pupa digger would hesitate to commence operations with his trowel. The fields in which alone Minos is found in abundance are of what has been well called the pavement order, platforms of solid rock with narrow avenues of verdure between: this is the character of extensive districts in the county of Galway, apparently caused by the long-continued action of currents of water, which has removed all earthy substances, and left exposed the rocky skeleton of the globe for the edification of geologists and the excoriation of the shins of the hasty insect hunter. Little value as one would suppose these stony tracts could be to any one but the naturalist, they are elaborately divided into sections by huge walls of rounded limestone boulders, so ingeniously piled up, without mortar, as frequently to bring down on the unwary trespasser who essays to cross them a dangerous avelanche of stone. Filipendulæ is the only other species of Anthrocera I have observed in the West of Ireland; it flies in company with Minos, in the proportion of about one to ten, and is readily distinguished on the wing by its larger size and brighter colouring. Minos is apparently very little subject to variation: out of one thousand specimens taken this season only two presented any noticeable difference from the ordinary type; in these the whole surface of the wings is suffused with crimson. They fly actively in the sunshine during the early part of the day, but after 4 P.M. are to be captured with the greatest ease asleep on the flowers; in some favoured spots every daisy will have its tenant, and I have seen as many as eight clustered on a dandelion, giving it at a little distance the appearance of a gorgeous crimson flower, enchanting alike to the naturalist and the painter.—*Edwin Birchall; Dublin, November* 28, 1857.

Lasiocampa Callunæ*: *is it a Species?—Mr. Richard Weaver, as much as nine years ago, contended (Zool. 1655) that it was; and since that time many other entomologists have expressed the same opinion. Nevertheless, the name has never appeared in our lists. I will now present the readers of the 'Zoologist' with my own observations on the subject. Early in the present year, that is in March, 1857, chance took me to Scotland, and, thus being on the right ground, I resolved to learn all I could, and form my judgment from my own personal observations; and, by the way, if all entomologists did the same we should not have so many mistakes made and repeated as we have at present. In the April following, while collecting on the moors, I found several empty cocoons and two full ones. These were spun up amidst moss and heather, and in the very wettest places. This is quite at variance with the usual habits of its congener, L. Quercus; and I was, moreover, particularly struck with the greater size and peculiar colour of the cocoons. Towards the end of June I observed several males flying over the moors, but I did not capture one. However, early in July a boy brought me a female, which soon deposited a number of eggs, much larger than those of L. Quercus. The young larvæ soon made their appearance; and I instantly had the pleasure of observing that they were totally different from those of Quercus: they were of a dark brown colour, with bright yellow bands between the segments of the body, very much as in the young larvæ of L. Rubi, which, indeed, they much resembled; and they had none of those white hairs which distinguish the young larvæ of L. Quercus. Some of these larvæ were sent to Captain Cox to figure, and others retained: these, as they advanced towards maturity, became more and more like their congener, especially in the last skin, a fact already stated by Mr. Weaver. The larvæ I retained have spun up, and I have several now in pupa. The full-grown larva is larger than that of L. Quercus; it feeds greedily on heather (*Calluna vulgaris*), ivy, birch, raspberry, sallow, and every other plant that comes in its way. The imago is much larger, and different in colour. I feel certain therefore that L. Callunæ is a species. Suppose I were to state that Psi and tridens, or Cucullia Verbasci and Scrophulariæ, were one species, and point to the exact similarity of colouring and marking, would not entomologists at once reply, "Oh, but the larvæ are totally different." This is considered conclusive and unanswerable, and if so in one case why not in another? I may add that L. Callunæ was found in the fens of Huntingdonshire many years back, by Mr. Courtnay, Mr. Standish and myself, as recorded at the time (Zool. 1731). In conclusion, I have only to add that I shall have great pleasure in answering any questions or objections that may be raised by any one in the pages of the 'Zoologist.'—*H. J. Harding; 1, York Street, Church Street, Shoreditch, November* 30, 1857. [The capture of Lasiocampa Callunæ in Huntingdonshire has been regarded as militating against the specific distinctness of what is called the Scotch eggar; but this observation will be found to bear only on the impropriety of that name. Supposing the two species to be really and permanently distinct, I should expect to find them domiciled together at Kinloch Rannoch, the fens of Huntingdonshire, Hampstead Heath, Dartmoor and the Cornish Heaths. If we find a large and dark-coloured insect confined to Scotland, the very excusable and immediate conclusion would be, "It is only a Scotch variety;" but a more philosophic inquiry is opened up by the southward extension of its geographical range.—*E. N.*]

Does any Insect feed on the Tea-tree?—Mr. Stainton having, in his 'Entomological Botany,' led us to suppose that every tree and plant is preyed upon by some insect, can any one inform me how it happens that we never meet with any dead insect or foreign substance in that article of universal use, tea. As tea cannot be sifted like most commercial products, it has always appeared to me a very remarkable circumstance that it is so totally free from anything unpleasant. Query, is there something so poisonous in the juices of the tea plant that insects will not meddle with it?—*William Atkinson.*

Notodonta Carmelita in 1858.—We hear of no fewer than 150 chrysalides of this insect having been imported from the Continent, to make their appearance here in May next as genuine British examples. We wonder whether it will occur in the woods in the neighbourhood of Sheffield?—*John Scott; Southfield Villas, Middlesbro'-on-Tees, November* 14, 1857.

Habits and Locality of Miana expolita.—This insect occurs in abundance in the West of Ireland at the end of June; its time of flight is about 4 P.M., but, from its small size and the rapidity of its movements, it is extremely difficult to capture. The males have the same habit of assembling round the female as the Bombyces, and by watching their flight we were able to take up a position near the centre of attraction, and secure them with comparative ease as they approached the spot. I should like to know whether any of the night-flying Noctuæ have been observed to assemble. The Irish specimens of Miana expolita are much brighter and richer in colouring than any I have seen from Darlington. When in perfect condition it is a beautiful insect, very different from the dingy little thing which represents it in most cabinets.—*Edwin Birchall; Dublin, November* 28, 1857.

Why is empyrea considered a Phlogophora?—I think some mistake has occurred in placing this insect amongst the group of which the meticulosa of our cabinets forms the type. In no character whatever does empyrea bear a resemblance to meticulosa, or even a species of which we are taught to consider Phlogophora as the generic title. The striking feature in this genus is the peculiarly scalloped wing, and empyrea does not show this. Besides, the colours of the genus Phlogophora are entirely composed of fawns and greens, and although this is of no importance in determining the place of the insect in question, yet one cannot help calling to remembrance what impresses the eyes and mind most forcibly when we are led to speak of the genus, or on looking over foreign species. Now, if empyrea be placed alongside lucipara, even a casual glance will convince any one that the general contour of the two insects are very similar, that the dark band of the wings is exceedingly like to each other, and that the position of the pale stigmata is the same in both; and I would propose that it be at once removed from the genus Phlogophora to that of Euplexia, as being most in harmony with requirements of that genus.—*John Scott; Southfield Villas, Middlesbro'-on-Tees, November* 17, 1857.

Capture of Ennomos fuscantaria near London.—A few days since, on looking over my captures of the past season, my attention was attracted to what I then thought was a specimen of Ennomos tiliaria. Upon closer examination and comparison with E. fuscantaria, I observed a similarity; I could not, however, be certain, and therefore took it to Mr. Newman, to whose kindness I am indebted for a comparison with a specimen he has, and with those at the British Museum. I am happy to say it proved to be E. fuscantaria. By reference I find I captured it near Kensington, on the 27th of August last, on a gas-lamp. I believe it is the first specimen that has been taken in that neighbourhood.—*John Henry Tilly; 3, Bernard Street, Regent's Park North, London, November* 2, 1857.

Tischeria angusticolella, Heyd., *and Solenobia triquetrella*, Hubn.—I bred the above additional species to our list in May last. The former makes a blotch mine in rose leaves, the perfect insect resembling Gelechia tenebrosella; the latter from cases found on and *under* mill-stone, grit-stone, &c., on the moors. This species and its habits are fully described in Bruand's 'Psychides,' pp. 106—7.—*R. S. Edleston; Bowdon, December* 7, 1857.

Note on the regular Perforation of Leaves.—May I venture to ask, through the medium of the 'Zoologist,' if a satisfactory explanation can be given of the symmetrical perforations found in the inclosed elm leaves? Are they the work of an insect, or the natural though unusual form of decay of the leaf? The leaves thus perforated were all found on the ground: can they be found in the same state when growing on the tree?—*Marie Wiry; Lentonfield, near Nottingham, November* 10, 1857. [The leaves are those of the wych elm, and the holes occur, with wonderful symmetry, at equal distances on each side of the midrib. They are evidently the work of the larvæ of a sawfly, which lays its eggs on the midrib of the leaf, and the young larvæ, descending right and left, devour the leaf, each making a single hole. It is, however, very difficult to account for the close similarity of size and shape observable in each opposite pair of holes. Something very similar has been observed in the destructive labours of the gooseberry grub, and a leaf thus perforated is very accurately figured at p. 59 of the 'Letters of Rusticus.'—*E. N.*]

Fungus on a Rhyncophorous Beetle.—Mr. Ingall has placed in my hands a specimen of Heilipus brachypterus which is in the finest condition, and looks as though it had been pinned while living, yet has several specimens of a black thread-like fungus, probably a Sphæria, growing from various parts of its body; three of these, about an inch in length, issue from the interstice between the prothorax and elytra; a fourth issues beneath the head, from the interstice between the head and prothorax; and there are many shorter ones in a diversity of situations; but none appear to have pierced the more solid parts of the exo-skeleton.—*Edward Newman.*

Notes concerning the capture of several interesting Species of Coleoptera.—Carabus intricatus is no longer a great rarity in this country. I have given a deal of time during the last three years to the working up of this insect, but until the autumn of 1856 had not met with living examples, having found remains only. Last autumn I accidentally found a wounded but still living specimen, which gave a clew to a habited locality. Having called upon a brother collector, and made known to him my fortune, I proposed that we should go and try for other specimens; accordingly, we started, and on the first day obtained several examples. I worked the whole of last winter and the preceding and present autumns, and find that up to the present time I have captured no less than 115 living specimens. The modes of capture are various, viz., by sugaring, searching among moss and loose stems of ivy upon trunks of trees, and by baiting wide-mouthed bottles with dead slugs. The times of appearance are early in summer and autumn, but the best time is the latter, as they are then fresh from the pupa condition and still immature; great care is necessary at this period in handling them, or they harden deformed: October is the middle of the season. They vary very considerably in size, as well as in intensity and shade of colouring, the size varying from 10 to 15 lines in length and from 3½ to 5½ in breadth, and the colour of some being almost black, others possessing fine tintings of green and violet. The period of impregnation is the spring; at no other time have I observed them in coition. The larva of this species I have not yet met with. C. intricatus, in common with other species of the genus, is supplied abundantly with a powerful acid of a caustic nature, as a means of defence against mightier animals; it is a fine adaptation, and one of the wonders of animal chemistry: this fluid is ejected from the anus. I have paid the penalty upon three occasions by having the acid thrown into my eyes, which for a long time were very painful. I will venture to say that no animal which preys upon this insect could maintain its hold should the discharge take place in either its mouth or eyes. I have, just by way of experiment, taken a male intricatus between my fingers and squeezed it slightly: it instantly discharged enough to make a patch upon my hand the size of a sixpence; a portion of this I placed in contact with my tongue; the effect was that of a strong acid, and the pain of course great: my tongue now presents a white patch, and I believe the skin is destroyed. I have taken two specimens of this beetle with a large puncture through the elytra, as though caused by the beak of a bird: I think it just possible that a bird and intricatus had exchanged shots. Of Panagæus quadripustulatus I captured eight specimens, on the coast, in April and May of the present year. Stenolophus elegans: Dr. Power, with his usual kindness, took me to the habitat of this hitherto rare species. My baggings were in a great minority compared with the Doctor's; still I captured a good set. Aëpys marinus and A. Robinii are both in plenty upon the sea-shore about Plymouth, the latter species in greater abundance than the former. Of the very distinct species, Hydroporus marginatus, *Dufts.*, I captured six specimens in the spring of the present year. Meloë brevicollis, another of the late Dr. Leach's Devonshire insects, has turned up; last season I took several, and this year I have captured seventeen more: it is a very distinct species; there is a good figure of it in the old Linnean Society's 'Transactions.'—*J. J. Reading; Plymouth, November* 21, 1857.

Capture of a Stenus new to the British Fauna.—Whilst on a visit to North Wales at the beginning of October, I had the good fortune to capture five specimens of a very singular Stenus, new to our British list. The species, which was identified by Mr. Janson (and no doubt correctly) with the S. rugosus of Kiesenvetter, is remarkable, *inter alia*, for the excessive roughness of its sculpture, a peculiarity which imparts to its surface a very uneven, and indeed most anomalous, appearance. It is a mountain insect, likewise, on the Continent; and I could only detect it, at Caernarvon, amongst wet earth and shingle at the edges of a small trickling stream which finds its way into the river which flows down from the Snowdon range through the Llanberis Pass. I may add that it was in company with the elegant Dianous cærulescens, and evidently extremely rare.—*T. Vernon Wollaston;* 10, *Hereford Street, Park Lane.*

Description and capture of Platystethus Capito in Scotland.—During a recent visit to Ross-shire I picked up a Platystethus which is new to me, and also, I think, an addition to the British Fauna. Its more prominent characters are as follows:—PLATYSTETHUS CAPITO, *Chevrier; Heer, Faun. Helv.* i. 208; *Ferm. et Laboul. Faun. Franc.* i. 608. Black, shining. Antennæ black, nearly as long as the head and thorax, gradually thickening towards the apex; third joint rather shorter than the second; terminal joint large, oval. Mouth rufescent. Head as wide as the thorax in the male, a little narrower in the female; rather thickly covered with large punctures, those behind the eyes often confluent; labrum and front of the head very smooth and glossy; above the base of the antennæ, on each side, a distinct glossy callus; a nearly obsolete channel on the head behind. Thorax as wide as the elytra, much rounded on the sides, and considerably narrowed behind; dorsal channel distinct; the punctures large and distant, with the interstices smooth and shining. Scutellum generally with two large punctures. Elytra quadrate, punctured in the

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Madeiran Coleoptera.

HOSE ENTOMOLOGISTS to whom *typical* specimens have a peculiar interest are informed that the duplicates of the Collection from which 'Catalogue of Madeiran Coleoptera' was lately prepared for the British Museum e been distributed into *five sets*, which are now offered for sale at £10 each. They be procured from E. W. Janson, Esq., 61, Gracechurch Street, London; and be viewed every Monday afternoon, by application to him at the Rooms of the omological Society, 12, Bedford Row. Four of the sets contain 220 species (equal 88 specimens) in each, and the fifth contains 250 species (equal to 750 specimens); in order to equalize them as far as was possible, *two* bound copies of the ographical Catalogue and Introductory Observations, constituting the preliminary ion of the 'Insecta Maderensia,' have been given with each of the "four" sets tioned above; as also two copies of the Topographical Catalogue, printed on one only, for labelling. The "two" Catalogues have been furnished with each, in to facilitate the sale, in the event of persons wishing to join in obtaining any one e sets; *for, wherever it was possible, sufficient specimens* (often amounting to 9 in number) *have been added of the various species to supply more than a single ction.* Each batch is packed into a green store-box; and the species, a great rtion of which are peculiar to the Madeira Islands, are principally from amongst maller tribes.

To Egg Collectors.

R. J. C. STEVENS will Sell by Auction, at his Great Room, 38, King Street, Covent Garden, London, W.C., on TUESDAY, the 9th day of ary, 1858, a COLLECTION of RARE and WELL-AUTHENTICATED S, formed in ALGERIA, by the Rev. H. B. TRISTRAM, containing those of fulvus, Cathartes percnopterus, Falco fulvus, F. imperialis, F. nævius, F. pennatrix scops, *Cuculus glandarius*, *Sylvia galactodes*, S. orphea, S. luscinoïdes, Alauda dactyla, A. cristata, A. calandra, *Hemipodius tachydromus*, Otis houbara, O. , Glareola pratincola, Ardea garzetta, A. russata, A. ralloïdes, Ibis falcinellus, topus melanopterus, Recurvirostra avocetta, Sterna anglica, S. leucopareïa, Anas A. strepera, A. nyroca, A. rufina, &c., &c. Catalogues in detail may be had on tion to the Auctioneer, as above.

Birds' Eggs.

. J. C. STEVENS is instructed to announce for Sale by Auction n TUESDAY, the 23rd of February, a COLLECTION of RARE EGGS, during the past season in LAPLAND, by J. WOLLEY, Esq. It will contain reat rarities. Catalogues are preparing.

H. KING, 85, Lower Union Street, Torquay, in returning his thanks to the gentry and others for the patronage they have kindly bestowed , begs to inform them that he has now on hand a stock of

. empyrea, 10s. each. D. Templi and C. obtusellus, 5s. each. H. hispidus, each. P. bractea, 2s. each. A. australis and L. phragmitella, 1s. each. S. uaria and P. stramentalis, 9d. each. P. flavalis and S. angustalis, 6d. each. rysophanus Hippothoë and several other rare and valuable Insects, all collected son, in the fens and other localities.

H. K. has also a quantity of rare BIRDS' EGGS from Shetland and Orkney, umber of Specimens of living and dried FERNS; also MARINE ANIMALS ANTS for the Aquarium, Specimens for which he is constantly collecting on onshire coast, which he supplies at a reasonable rate.

N. H. MASON will shortly leave for the CAPE DE VERD LANDS. Those who wish to participate in his Natural-History Collections group are requested to communicate their names to S. Stevens, Esq., 24, ury Street, or to N. H. Mason, Esq., 3, Red Lion Square, thus securing the ce. Mr. Mason's Madeira dried Plants and Ferns are now being distributed: he best sets still remain.

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